ORDER NO. HAD8706182A2

Service Manual

Receiver

QUARTZ Synthesizer
MW/LW/FM Stereo Receiver

SA-R210L

Color

(K).....Black Type

Area

Color	Area
(K)	(EW).....Switzerland.
(K)	(EF).....France.
(K)	(EB).....Belrium.
(K)	(EK).....United Kingdom.

Please use this manual together with the service manual for Model No.SA-R210, Order No.HAD8706173C8.

CHANGES

■ REPLACEMENT PARTS LIST

Note: Mentioned in this parts list are only those different from Model No.SA-R210for the destination (EX) area.
Important safety notice : Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer'sspecified parts.

Ref.No.	Change of Part No. SA-R210 (EX)	→ SA-R210L (EW,EF,EB,EK)	Part Name & Description	Remarks
TRANSISTORS				
Q211	----------	**2SA933SQR**	Switching	Addition
Q212 ~ Q214	----------	**2SC1740SQ**	Switching	Addition
Q925,Q926	----------	**2SC2785F**	Switching	Addition
DIODES				
D203	KV1260Z	----------	O.S.C.	Deletion
D207	----------	**KV1260Z**	O.S.C.	Addition
D925	----------	**MA165**	Switching	Addition
VARIABLE CAPACITORS				
CT201	ECRHA010A41	----------	Trimmer	Deletion
CT202	----------	**ECRHA020D41**	Trimmer	Addition
CT203	----------	**ECRHA010A41**	Trimmer	Addition
COILS				
L201	SLA2B1-W	----------	Antenna , Coil	Deletion
L202	SLO2B7-W	----------	O.S.C. , Coil	Deletion
L206	----------	**SLA1B7R-P**	Antenna , Coil	Addition
L207	----------	**SLO1B5-P**	O.S.C. , Coil	Addition
L208	----------	**SLA2B3-P**	Antenna , Coil	Addition
L209	----------	**SLO2B9R-P**	O.S.C. , Coil	Addition

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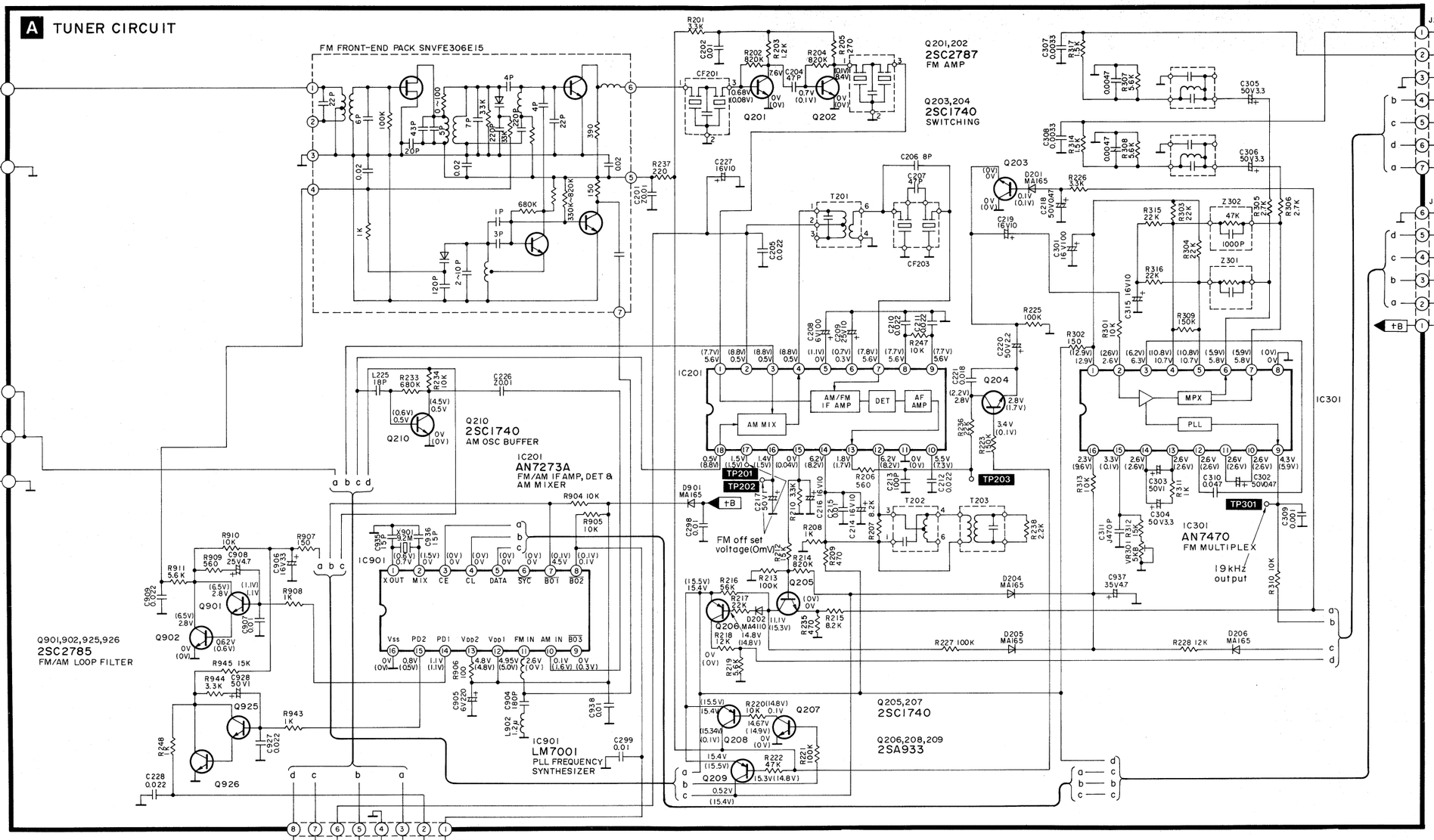
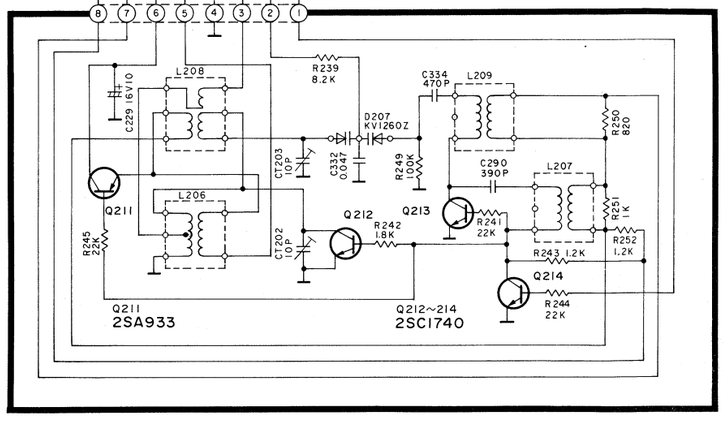
Ref.No.	Change of Part No. SA-R210 (EX)	→ SA-R210L (EW,EF,EB,EK)	Part Name & Description	Remarks
TRANSFORMERS				
T1 ⚠	SLT5M507-W	**SLT5M507-W (EW,EF,EB)**	Power Source	
T1 ⚠	SLT5M507-W	**SLT5M508-W (EK)**	Power Source	Change
FUSES				
F1 ⚠	XBA2C10TRO	**XBA2C10TRO (EW,EF,EB)**	250V , T1.0A	
F1 ⚠	XBA2C10TRO	**XBA2C10TBO (EK)**	250V , T1.0A	Change
RESISTORS				
R229	ERDS2TJ102	----------	Carbon , 1/4W , 1kΩ ,± 5%	Deletion
R230	ERDS2TJ104	----------	Carbon , 1/4W , 100kΩ ,± 5%	Deletion
R231	ERDS2TJ821	----------	Carbon , 1/4W , 820Ω ,± 5%	Deletion
R232	ERDS2TJ122	----------	Carbon , 1/4W , 1.2kΩ ,± 5%	Deletion
R239	----------	**ERDS2TJ822**	Carbon , 1/4W , 8.2kΩ ,± 5%	Addition
R241	----------	**ERDS2TJ223**	Carbon , 1/4W , 22kΩ ,± 5%	Addition
R242	----------	**ERDS2TJ182**	Carbon , 1/4W , 1.8kΩ ,± 5%	Addition
R243	----------	**ERDS2TJ122**	Carbon , 1/4W , 1.2kΩ ,± 5%	Addition
R244	----------	**ERDS2TJ473**	Carbon , 1/4W , 47kΩ ,± 5%	Addition
R245	----------	**ERDS2TJ223**	Carbon , 1/4W , 22kΩ ,± 5%	Addition
R248	----------	**ERDS2TJ102**	Carbon , 1/4W , 1kΩ ,± 5%	Addition
R249	----------	**ERDS2TJ104**	Carbon , 1/4W , 100kΩ ,± 5%	Addition
R250	----------	**ERDS2TJ821**	Carbon , 1/4W , 820Ω ,± 5%	Addition
R251	----------	**ERDS2TJ102**	Carbon , 1/4W , 1kΩ ,± 5%	Addition
R252	----------	**ERDS2TJ122**	Carbon , 1/4W , 1.2kΩ ,± 5%	Addition
R943	----------	**ERDS2TJ102**	Carbon , 1/4W , 1kΩ ,± 5%	Addition
R944	----------	**ERDS2TJ332**	Carbon , 1/4W , 3.3kΩ ,± 5%	Addition
R945	----------	**ERDS2TJ153**	Carbon , 1/4W , 15kΩ ,± 5%	Addition
CAPACITORS				
C222	ECQM1H473KV	----------	Polyester , 50V ,0.047μF , ± 10%	Deletion
C223	ECCD1H100KC	----------	Ceramic , 50V ,10pF , ± 10%	Deletion
C224	ECQP1471JZ	----------	Polyproylene , 100V ,470pF , ± 5%	Deletion
C228	----------	**ECKD1H223ZF**	Ceramic , 50V ,0.022μF , +80% , -20%	Addition
C229	----------	**ECEA1CK100**	Electrolytic , 16V ,10μF	Addition
C332	----------	**ECQM1H473KV**	Polyester , 50V ,0.047μF	Addition
C333	----------	**ECCD1H100KC**	Ceramic , 50V ,10pF , ± 10%	Addition
C334	----------	**ECQP1471JZ**	Polyproylene , 100V ,470pF , ± 5%	Addition
C927	----------	**ECKD1H223ZF**	Ceramic , 50V ,0.022μF , +80% , -20%	Addition
C928	----------	**ECEA1HK010**	Electrolytic , 50V ,1μF	Addition
CABINET AND CHASSIS				
6	SYYAR210KEX	**SYYAR210LKEW**	Front , Panel	Change
12	SBC932B	**SBC932-2A**	Buuton	Change
ACCESSORIES				
A1 ⚠	SFDAC05E03	**SFDAC05E03 (EW,EF,EB)**	AC Cord	
A1 ⚠	SFDAC05E03	**SFDAC05G02 (EK)**	AC Cord	Change
A5	SQF12959	**SQF12959 (EW,EB)**	Instruction Book	
A5	SQF12959	**SQF12966 (EF)**	Instruction Book	Change
A5	SQF12959	**SQF12961 (EK)**	Instruction Book	Change
A7	----------	**SJP9009 (EK)only**	Plug	Addition
PACKING				
P1	SPG5971	**SPG5972 (EW,EB,EK)**	Carton Box	Change
P1	SPG5971	**SPG5973 (EK)**	Carton Box	Change

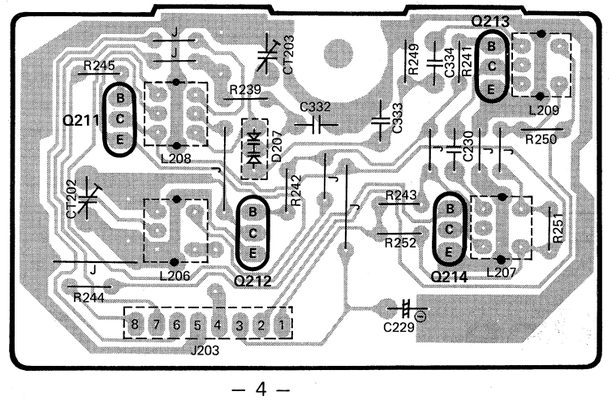
■ SCHEMATIC DIAGRAM

A TUNER CIRCUIT





● Addition of Printed Circuit Board



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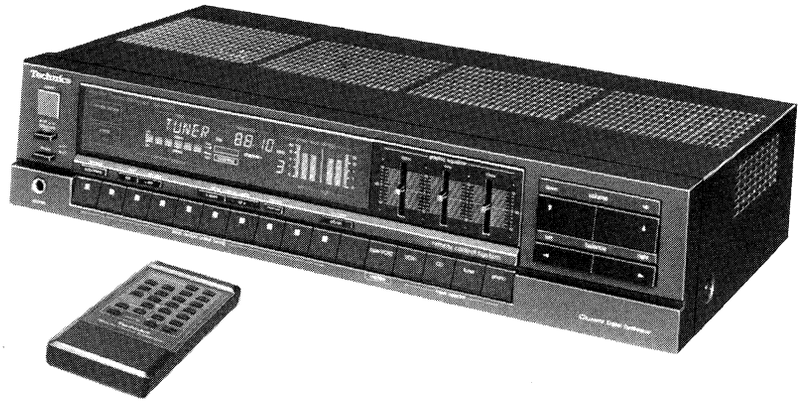

Color

(K).....Black Type

Area

Color	Area
(K)	(EX).....Continental Europe.
(K)	(EH).....Holland.
(K)	(XL).....Australia.

SPECIFICATIONS

(DIN 45 500)

■ AMPLIFIER SECTION

1 kH continuous power output both channels driven	2 x 45 W (8Ω)
Total harmonic distortion half power at 1 kHz	0.03% (8Ω)
Intermodulation distortion rated power at 60 Hz:7 kHz = 4:1,SMPTE,8Ω	0.5%
Power bandwidth both channels driven,-3dB	10 Hz ~ 40 kHz (8Ω)
Damping factor	20 (8Ω)
Input sensitivity and impedance	
PHONO	3 mV/47 kΩ
CD,VCR 1,TAPE/VCR 2	200mV/22 kΩ
PHONO maximum input voltage (1 kHz,RMS)	150 mV
S/N	
rated power(8Ω)	
PHONO	70 dB (IHF,A:80 dB)
CD,VCR 1,TAPE/VCR 2	85 dB (IHF,A:90 dB)
Frequency responce	
PHONO	RIAA standard curve ± 0.8 dB(30 Hz ~ 15 kHz)
CD,VCR 1,TAPE/VCR 2	10 Hz ~ 70 kHz (-3 dB)
3 band graphic equalizer	100 Hz,-10 dB ~ +10 dB
	1 kHz,-10 dB ~ +10 dB
	10 kHz,-10 dB ~ +10 dB
Loudness control (volume at -30 dB)	50 Hz, +9 dB
Output voltage	
TAPE/VCR 2 REC OUT	200 mV
Channel balance, 250 Hz ~ 6,300 Hz	±1 db
Channel separation	55 dB
Headphones output level and impedance	400 mV/330 Ω
Load impedance	
MAIN or REMOTE	4 Ω ~ 16 Ω
MAIN and REMOTE	8 Ω ~ 16 Ω

■ FM TUNER SECTION

Frequency range	87.50 ~ 108.00 MHz
Sensitivity	
S/N 30 dB	1.5 µV (75Ω)
S/N 26 dB	1.3 µV (75Ω)
S/N 20 dB	1.2 µV (75Ω)
IHF usable sensitivity	1.5 µV (IHF '58,75Ω)
IHF 46 dB stereo quieting sensitivity	22 µV/75Ω
Total harmonic distortion	
MONO	0.2%
STEREO	0.3%
S/N	
MONO	60 dB (75 dB,IHF)
STEREO	58 dB (71 dB,IHF)
Frequency response	20 Hz ~ 15 kHz, +1 dB ~ -2 dB
Alternate channel selectivity	±400 kHz,65 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	40 dB
IF rejection at 98 MHz	70 dB
Spurious response rejection at 98 MHz	70 dB
AM suppression	50 dB
Stereo separation	
1kHz	40 dB
10 kHz	30 dB
Carrier leak	
19 kHz	-30 dB (-35 dB,IHF)
38kHz	-45 dB (-50 dB,IHF)
Channel balance (250 Hz ~ 6,300 Hz)	±1.5 dB
Limiting point	1.2 µV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	100 kHz
Antenna terminals	75 Ω (unbalanced)

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■ AM (MW) TUNER SECTION

Frequency range	522 ~ 1611 kHz (9 kHz-step) 530 ~ 1620 kHz (10 kHz-step)
Sensitivity (S/N 20 dB)	20 μV,330 μV/m
Selectivity at 999 kHz	55 dB
Image rejection at 999 kHz	40 dB
IF rejection at 999 kHz	55 dB

■ GENERAL

Power consumption	240 W
Power supply	
For Australia	AC 50 Hz/60 Hz,240 V
For continental Europe	AC 50 Hz/60 Hz,220 V
For others	AC 50 Hz/60 Hz, 110 V/127 V/220 V/240 V
Dimensions (W x H x D)	430 x 97 x 243 mm (16-15/16″ x 3-13/16″ x 9-9/16″)
Weight	5.1 kg (11.1 lb.)

Notes:

1.Specifications are subject to change without notice. Weight and dimensions are approximate.

2.Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

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■ BEFORE REPAIR AND ADJUSTMENT

(1)Turn off the power supply. Using a 10Ω, 5W resistor connect both ends of power supply capacitors(C703,C704) in order to discharge the voltage.

(2)Before turning the power supply on , after completion of repair , slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50Hz/60Hz in NO SIGNAL mode should be shown below with respect to supply voltage 110V/127V/220V/240V.

Power supply voltage	AC110V	AC127V	AC220V	AC240V
Consumed current 50/60Hz	150 ~ 450mA	100 ~ 400mA	40 ~ 190mA	50 ~ 200mA

■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

* No sound is heard when the power is switched ON.

* Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted" , or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlined below:

1.Switch OFF the power.

2.Determine the cause of the problem and correct it.

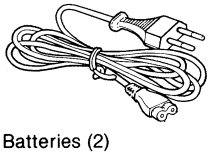
3.Switch ON the power once again.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first switched OFF and then ON again.

■ ACCESSORIES

- AC power supply cord (1)
  SFDAC05E03 (EX, EH)
  SJA173 (XL)

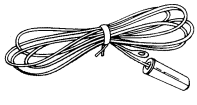


- Batteries (2)
  UM–3NE

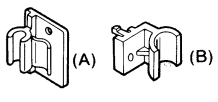
Panasonic Panasonic

- Connection cables for remote-control (2)
  SJP2257K

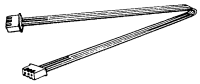
- FM indoor antenna (1)
  SSA270M (EX, EH)
  SSA269M (XL)



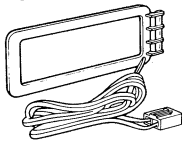
- AM antenna holders (2)



- Flat cable for remote-control (1)
  SWKST11M–1

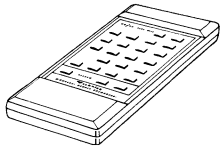


- AM loop antenna (1)
  SPB1152T



- Screws (2)

- Remote-control transmitter (1)
  EUR64197



■ LOCATION OF CONTROLS

Amplifier section

Input selector display
Shows the sound source selected by the input selectors.

Tape indicator (TAPE)

Loudness indicator (loudness)

Volume/balance level indicators (volume/balance)
These indicators usually show the volume level; when the balance control is pressed, however, the position of balance level is displayed for five seconds, after which the display returns again to indicate of the volume level. When the muting button (on the remote-control transmitter) is pressed, the indicator corresponding to the maximum displayed volume level point will flash.

Peak-power indicators (power level)
These indicators indicate the peak power value of the output level to the speaker systems.

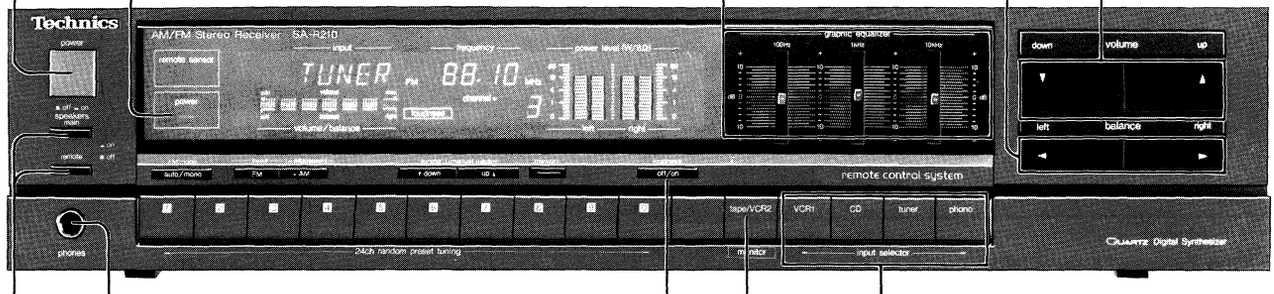
Equalizer controls (graphic equalizer)
These controls are used to adjust the levels within each frequency band. The levels can be varied continuously over a range of +10 dB ~ −10 dB. By sliding the controls at each of the indicated frequencies in the "+" direction, the frequencies in that band are boosted, and by sliding them in the "−" direction, the frequencies in that band are attenuated.
When the power switch is set to the "on" position the tip of these levels controls will illuminate.

Balance controls (balance)

Power switch (power)

Power indicator (power)
When the power switch is set to the "on" position, this indicator illuminates to indicate that the unit is in operation.

Volume controls (volume)



Headphones jack (phones)

Input selectors (input selector)
These selectors are used to select the sound source to be heard, such as a disc, radio broadcasts, etc.
The select sound source shows on the input selector display.

Speaker selectors (speakers)
These selectors are used to turn the speaker systems on and off.

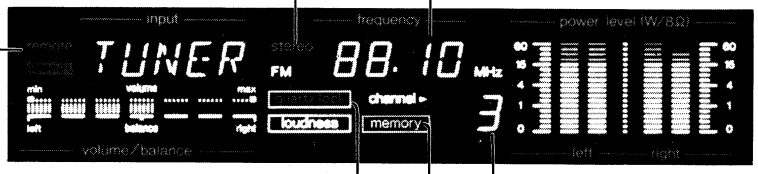
Loudness switch (loudness)
Set to the "on" position when listening to music at low volume. Auditory perception of sound in the low frequency range falls off at low volume, but when the switch is in this position, this deficiency is compensated for, so that the full impact of the musical performance can be enjoyed.

Tape-monitor switch (monitor)
Press this button to listen to tape.
No other sources selected by the input selector can be heard while the tape indicator is illuminated. To listen to some other source, press this button once again.

Tuner section

FM stereo indicator (stereo)
This indicator automatically illuminates when an FM stereo broadcast is being received.
Note: It will not illuminate if the FM mode selector is pressed.

Digital frequency display
The reception frequency of the FM or AM broadcast selected by using the tuning buttons or the preset-tuning buttons is indicated.



Remote-control signal indicator (remote)
This indicator illuminates when the remote-controle transmitter is operated.

Channel display
The channel number selected by the preset-tuning buttons is displayed.

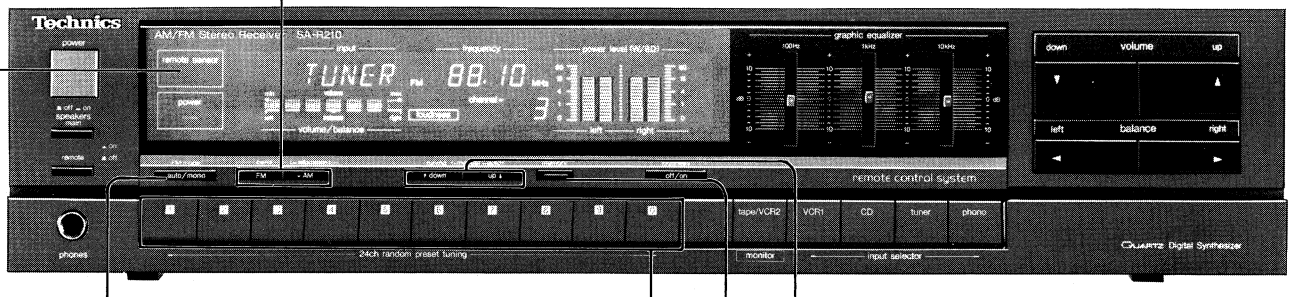
Quartz-lock indicator (quartz lock)
This indicator illuminates when tuned precisely to an FM or AM station.

Memory indicator (memory)
This indicator illuminates when the memory button is pressed.

Band selectors (band)

FM	- AM

FM: Press this button to listen to an FM broadcast.
AM: Press this button to listen to an AM broadcast.
allocation:
When the AM button is pressed for about 4 seconds, the AM frequency step will change to 10 kHz per step. (This step is set to 9 kHz before shipment.) In order to return to the original frequency indication, press this button for about 4 seconds again.



FM mode selector (FM mode)
This unit automatically switches to the stereo mode when a stereo broadcast is received. Press this selector to listen in the monaural mode. The FM stereo indicator will not illuminate in the monaural mode.

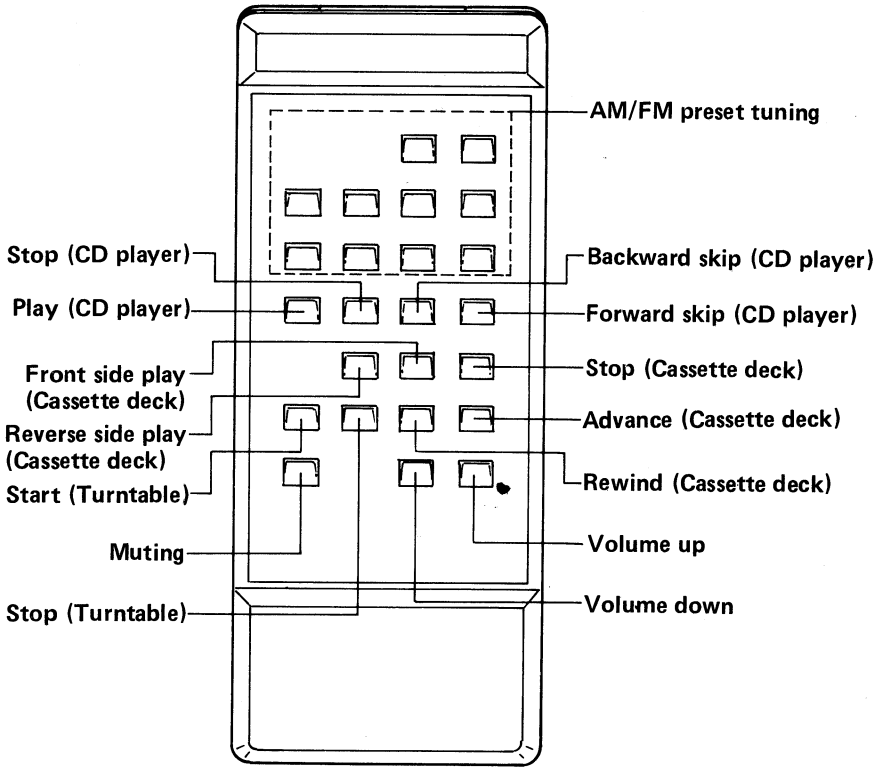
Tuning buttons (tuning)
These buttons are used for tuning to the desired broadcast station.

Memory button (memory)
This button is used when preset memory setting of the preset-tuning buttons is made.

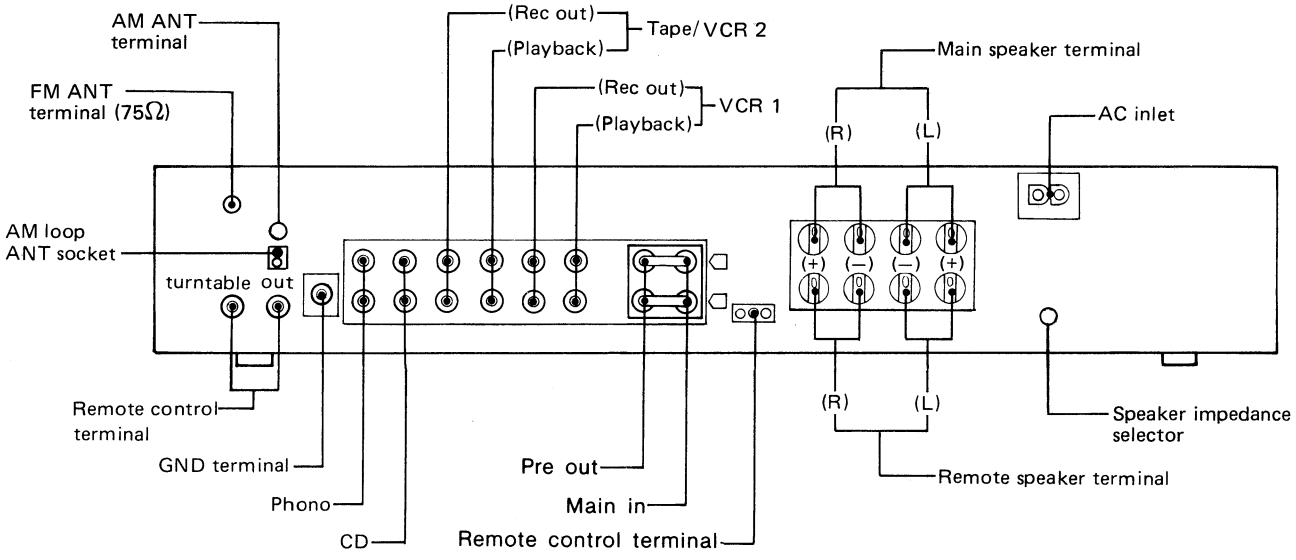
Preset-tuning buttons (1 ~ 0) (24 ch random preset tuning)
These buttons are used to preset FM and AM broadcast frequencies into the memory of this unit, and are also pressed to select the desired preset frequencies.

Remote-control signal sensor (remote sensor)
Receives the signals from the remote-control transmitter.

- **Remote-control transmitter (EUR64197)**



- **Rear panel**



■ STANDARD OPERATING PROCEDURE

Before listening to a disc, radio broadcast, etc., (steps 1, 2, 3)

1 Select the main and/or remote speaker systems to be used.

Note:
When only one system of speakers is connected, no sound will be heard if both speaker selectors are pressed.

2 "on" (▮→ ▂)
(The power indicator will illuminate.)

3 Check to be sure the tape indicator is not illuminated.
If the tape indicator is illuminated, press this selector.

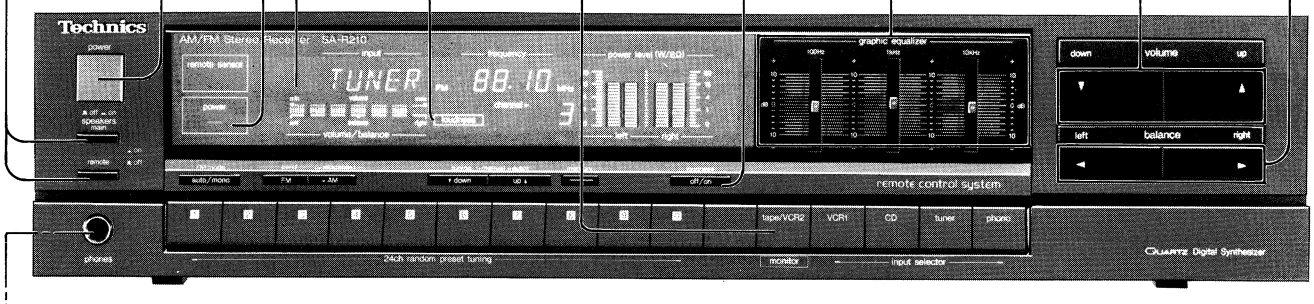
After disc play or radio broadcast, etc. has started

• Set to "on" position when listening at low volume level.
(The loudness indicator will illuminate.)

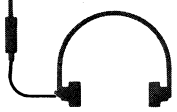
• Adjust tone quality as desired.
(See below.)

Adjust left/right volume balance.
While listening to an AM (MW/LW) broadcast or a monaural FM broadcast, balance the sound so that it seems to be heard from the center, between the speakers.
If both ("left" and "right") balance controls are pressed at the same time, balance will be set to the center position automatically.

Adjust the volume level.



When listening through headphones



Headphones (option)

If sound from the speakers is not wanted, set the speaker selectors to the "off" position.

Note:
Set the volume level to a minimum before connecting headphones.

After use

Be sure to reduce the volume level, and switch OFF the power.

Note:
The input selection, the volume level, the volume balance, the tone quality, and the muting settings will be kept as they were at the time when the power is switched OFF, i.e. the memory back-up function.

The characteristics of each frequency band

100 Hz

This is the deep bass range. By increasing the control setting, the sound of a bass guitar, drums, etc. can be made more massive and substantial.

1 kHz

This is the range in which most of the vocal range of the human voice is included. By increasing the control setting, vocal reproductions become more full of life and greater realism and ambience can be added.

10 kHz

This is the range in which finely subtle tones of radiance and splendorous luminance can be added. By increasing the control setting, an extra measure of glitter can be added, for example, to the sounds of the cymbals, triangle, etc. This control can also be used, by reducing its setting, to decrease annoying tape "hiss" noises.

■ MEMORY PRESETTING

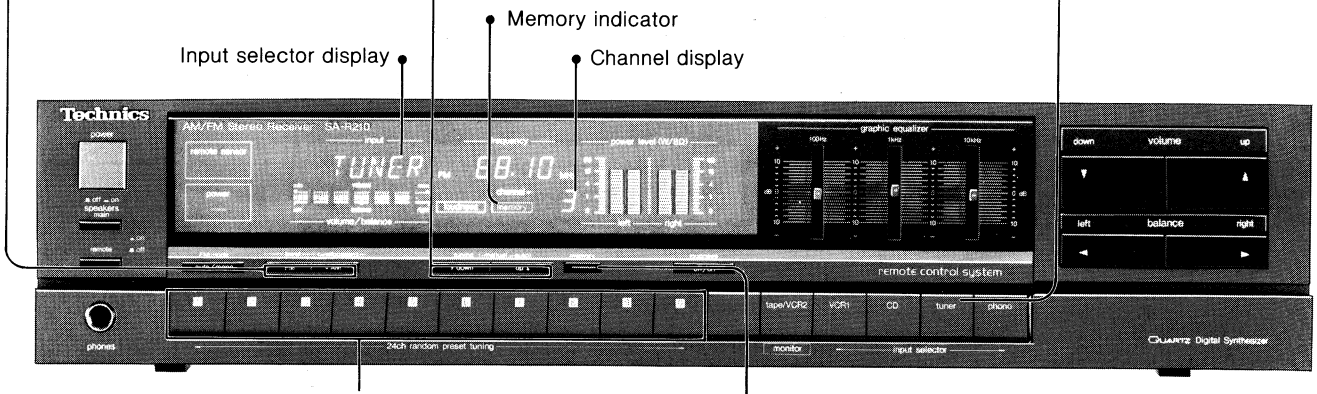
With this unit you may preset as many as 24 radio broadcast stations: FM/AM random presetting. After broadcast stations have been preset as described below, any desired station can be quickly and easily selected.
Stations can be freely preset to any desired channel.

Have you completed the "Standard Operating Procedures" (page 8)?

1 **"tuner"**
The input selector display shows "TUNER".

2
"FM": for FM broadcasts
"AM": for AM broadcasts

3 **Press the appropriate tuning button to tune to the desired broadcast.**
Tuning
Press the left button to change the frequency downward, and press the right button to change the frequency upward.
- **Automatic tuning**
  Press the button. When the frequency indication begins to change, release the button (a broadcasting station will be selected automatically). Repeat this operation until the desired station is found.
- **Manual tuning**
  Press the button momentarily and tune to desired station. Frequency will change each time the button is pressed.



4 **Press.**
(The memory indicator will illuminate.)

5 **Select the desired "channel".**
Example: To select "channel" 12:
Press [1] and then [2].
Note:
Make the entry without interruption between steps. If there is an interval of about two seconds or more between steps, you may not obtain the desired settings. In this case, perform steps 3~6 again to reset the memory as necessary.
(If the correct presetting cannot be confirmed on the channel display, then reset the memory.)

6 **Enter the name (call sign, etc.) of the preset broadcasting station on the station memory file sheet.**
This completes the procedures for presetting radio broadcast frequencies. The other preset-tuning buttons can be preset in the same way by following steps 2 through 6.

Note:
If a new broadcasting station is preset into a channel, the broadcasting station which was previously entered in that channel will be automatically erased.

"Most-recent" memory

The most-recent memory is a system by which the unit "remembers" the FM or AM broadcast station last heard when this unit is switched OFF, and automatically tunes to that station the next time the power is switched ON.

"Back-up" memory

This is the function which preserves the preset memory and most-recent memory functions. In the event of a power failure, or if this unit is not used for a long period of tume, the back-up memory will preserve the preset memory and most-recent memory functions for as long as approximately one month.

To prevent erasing the memory

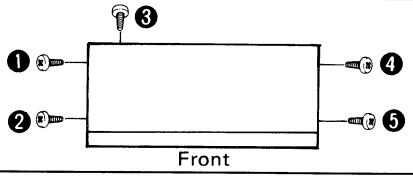
The memory settings will be erased in the following cases.
For example:
1) If this unit is not used for one month or longer,
2) If an audio timer is used and the timer does not operate this unit for one month or longer,
3) If a power failure occurs, etc.

If any of the above occurs, the memory will have to be reset.
The memory in this unit is maintained by a gold capacitor. If the power supply is interrupted for one month or longer, set the power switch to the "on" position for sixty minutes or more in order to recharge the gold capacitor. Then reprogram the memory.

■ DISASSEMBLY INSTRUCTIONS

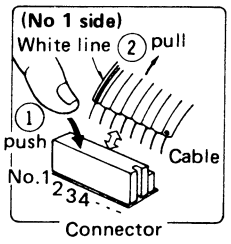
"ATTENTION SERVICER"
SOME CHASSIS COMPONENTS MAY HAVE SHARP EDGES. BE CAREFUL WHEN DISASSEMBLING AND SERVICING.

Ref. No. 1	How to remove the cabinet
Procedure 1	1. Remove the screws ❶ ~ ❺.



Ref. No. 2	How to remove the front panel
Procedure 1 → 2	1. Remove the screws ❶ ~ ❺. 2. Remove the flat cables J801 and J802.

Removing the flat cable



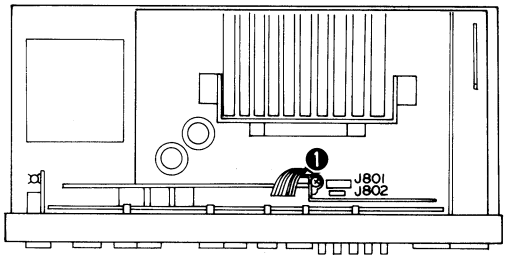


Fig. 1

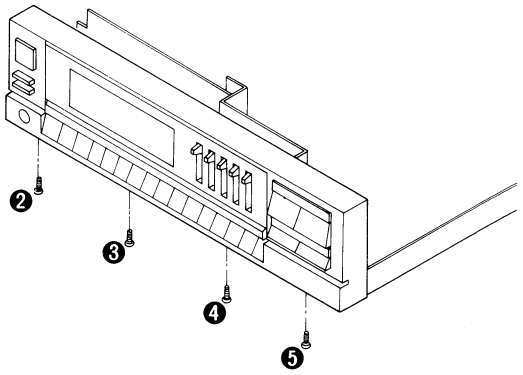
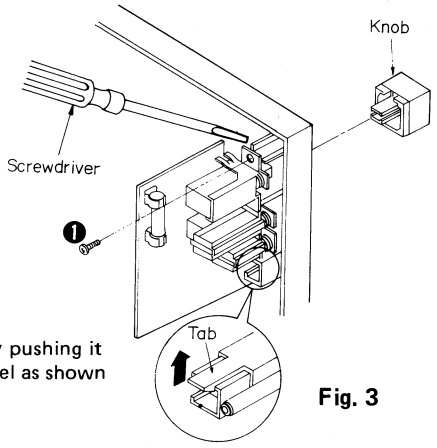


Fig. 2

Ref. No. 3	How to remove the sub P.C.B.
Procedure 1 → 2 → 3	1. Remove the power switch knob. 2. Remove the screw ❶. 3. Pull-up tab. 4. Remove the power switch P.C.B.



Remove the knob by pushing it from behind the panel as shown in figure 3.

Fig. 3

5. Remove nylone rivet ❷.
6. Remove the shield plate.
7. Remove screw ❸.
8. Remove the P.C.B. holder.
9. Remove the microcomputer P.C.B.

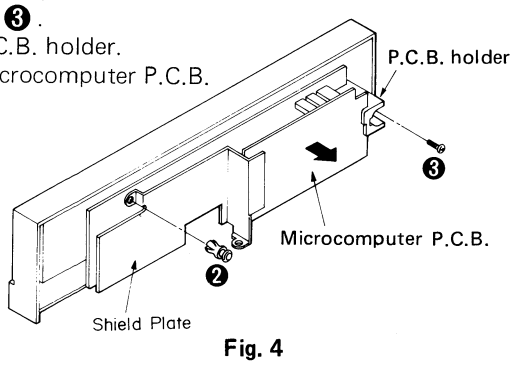


Fig. 4

10. Remove screws ❹ ~ ❼.
11. Remove the FL/Graphic equalizer P.C.B.

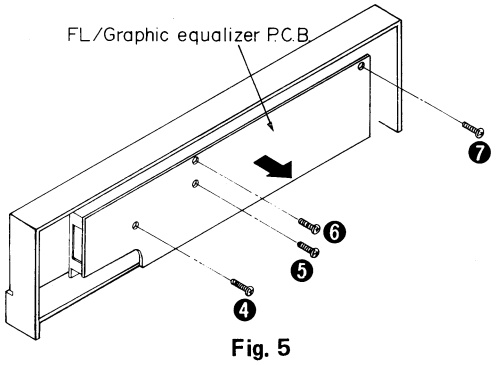


Fig. 5

12. Remove screws ❽ ~ ⓱.
13. Remove the P.C.B. Holder.
14. Push in the tabs.
15. Remove the volume and key switch P.C.B.'s. These P.C.B.'s must be removed together because they are joined by a connector.

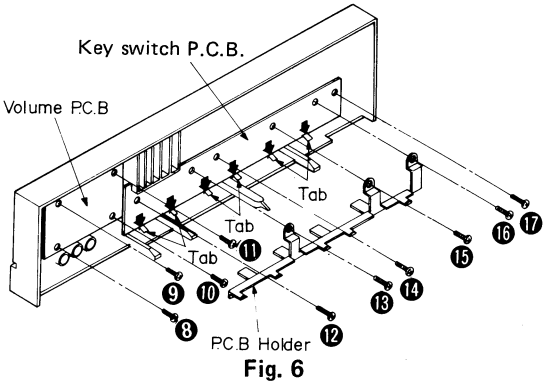


Fig. 6

Ref. No. 4	How to remove the tuner and main P.C.B.
Procedure 1 →4	1. Remove screws ❶ ~ ⑯. 2. Remove the tuner and main P.C.B.'s.

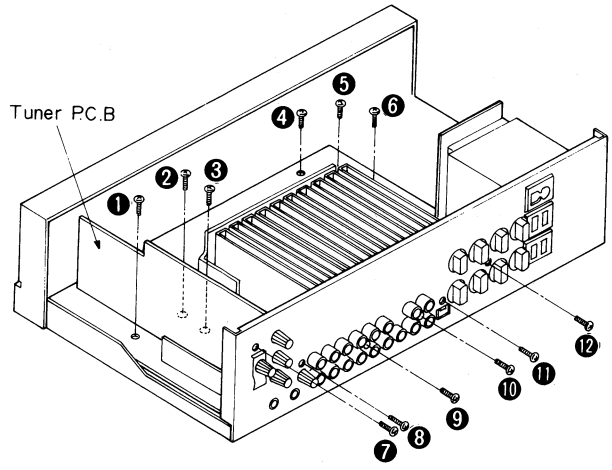


Fig. 7

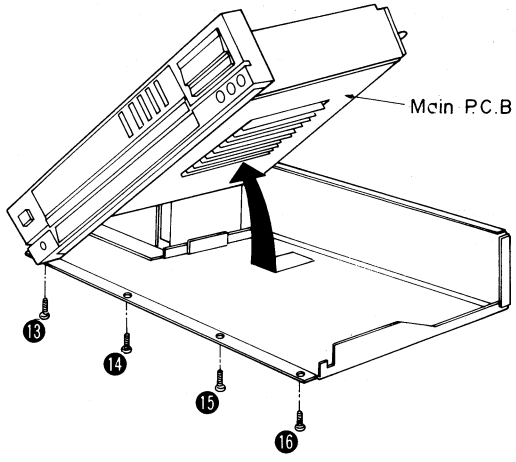


Fig. 8

Ref. No. 5	How to remove the power IC
Procedure 1 →4 →5	1. Unsolder the power IC. 2. Remove screws ❶, ❷.

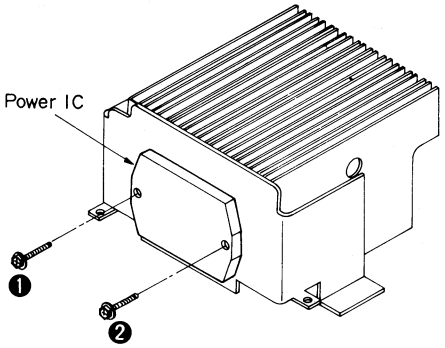
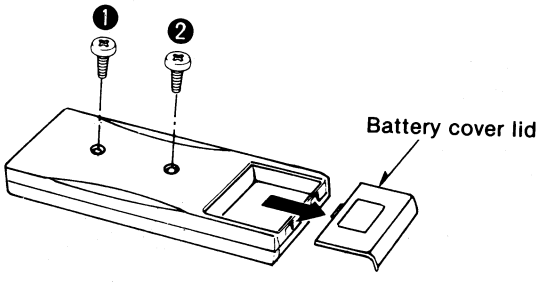


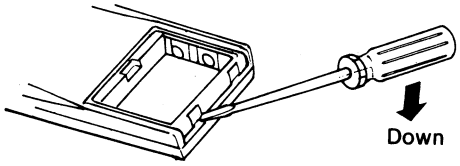
Fig. 9

- The thermal compound must be applied smoothly and evenly to assure good heat transfer between the power IC and the heat sink.
  When mounting the power IC, apply silicon thermal compound (SZZ0L15 or equivalent) to the rear of the power IC.

Ref. No. 6	How to disassemble the remote control
Procedure 6	1. Remove the Battey cover lid. 2. Remove screws ❶ and ❷.



3. Insert a flat blade screwdriver between the upper and lower covers inside the battery compartment and them slowly loosen the bottom cover.



■ HOW TO CHECK THE FL DISPLAY AND MICROCOMPUTER PRINTED CIRCUIT BOARDS

1. Remove the cabinet (see disassembly procedure Ref. No. 1).
2. Remove the front panel (see disassembly procedure Ref. No. 2).
3. Remove the microcomputer P.C.B. and the FL P.C.B. from the front panel (see disassembly procedure Ref. No. 3).
4. Remove the main P.C.B. (see disassembly procedure Ref. No. 4).
5. Connect the 9 flat extension cables as follows (Fig. A and B):
   * Between the key switch P.C.B. and the FL P.C.B., connect J904 (6-pin), J905 (6-pin), and J906 (6-pin).
   * Between the microcomputer P.C.B. and the FL P.C.B., connect J907 (6-pin), J908 (6-pin), J909 (9-pin). J910 (9-pin), J911 (6-pin), and J912 (6-pin).
   * Between the FL P.C.B. and the remote control sensor P.C.B., connect J913 (5-pin).

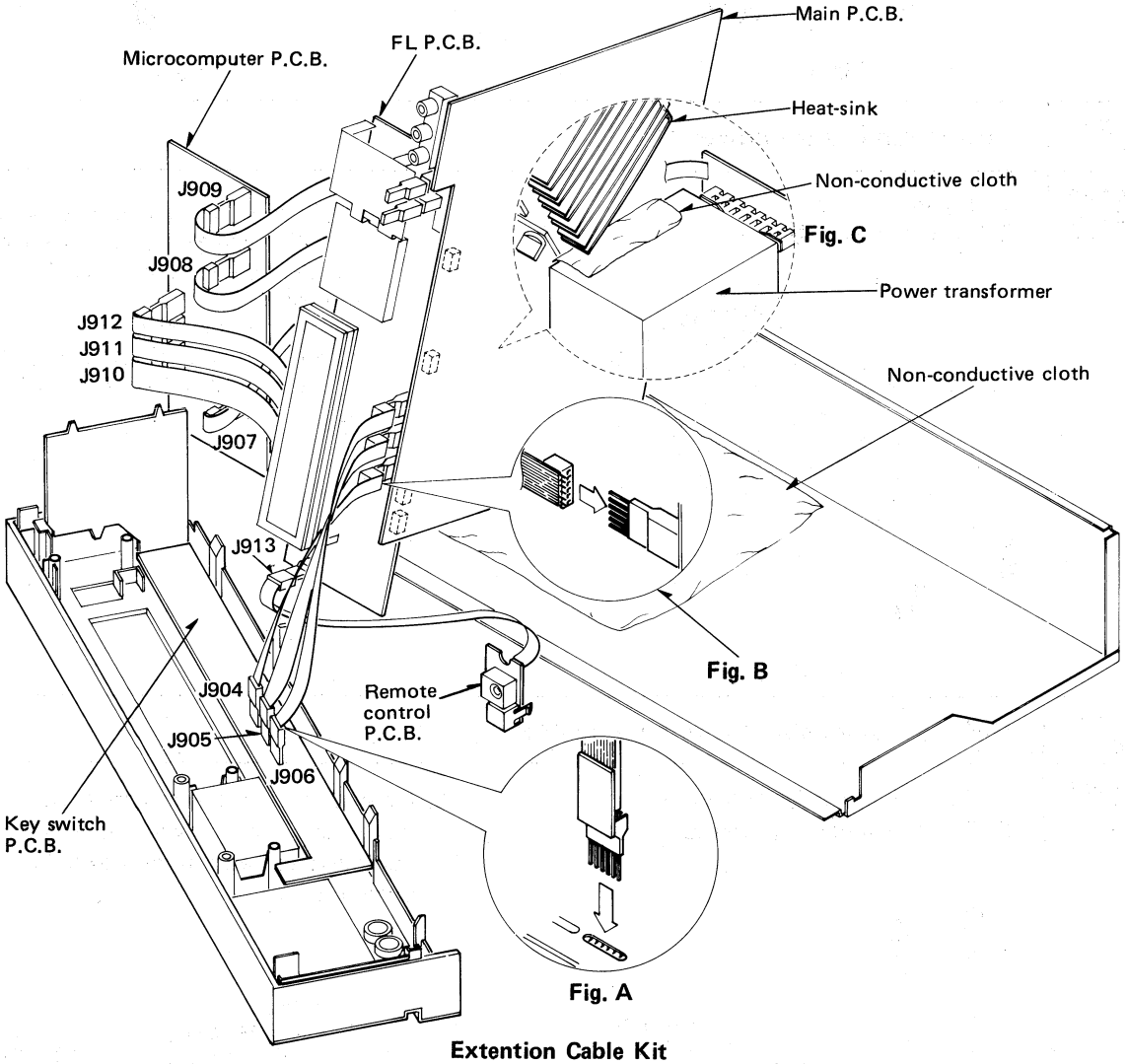
Caution: Be sure to maintain the correct polarity when connecting the extension cables. Reversing the polarity of a connection between P.C.B.'s can cause severe damage to the unit.

6. Re-attach the FL P.C.B. to the main P.C.B.
7. Lean the main P.C.B. on its edge with its heatsink on the power transformer (Fig. C).

Caution: Cover the chassis and the power transformer with a non-conductive cloth to prevent a short circuit.

Notes:

1. If it is determined that the problem is on the main P.C.B., it is only necessary to remove the bottom cover to troubleshoot this unit.
2. If it is determined that the problem is not on the main P.C.B., it is not necessary to remove the main P.C.B. (step 4) and lay it on its side (step 7) to troubleshoot this unit.



Extention Cable Kit

Kit. No.	Extension cables	Qty Included	Required Quantity for Model:			
			SA-R210	SA-R310	SA-R410	SA-R510
SZZA1087C	5 pin	5	1	1	2	5
	6 pin	7	7	7	6	6
	7 pin	5	0	0	2	5
	9 pin	2	2	2	2	1

■ MEASUREMENTS AND ADJUSTMENTS

■ AM/FM

Control positions and equipment used

- AM and FM signal generator (AM and FM-SG)
- Stereo modulator
- Distortion analyser
- Oscilloscope
- AC and DC electronic voltmeter (EVM)
- Frequency counter
- Choke coil (100μH)
- Resistor (100kΩ)
- Ceramic capacitor (200pF)

Note: For **T201, L202, L301, L302** and **T204,** adjusted parts are supplied. So, do not turn the cores of this parts.

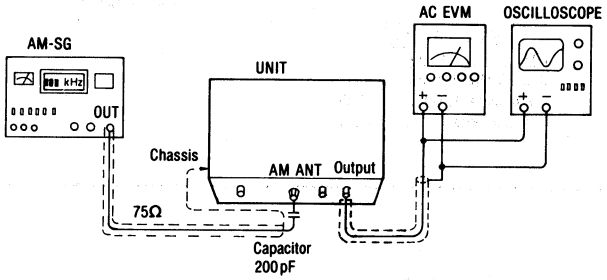
AM-RF ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**AM**" position.
3. Place the radio frequency display and signal generator setting to **612kHz.**
4. Adjust **L201** for maximum output.
5. Place the radio frequency display and signal generator setting to **1503kHz.**
6. Adjust **CT201** for maximum output.
7. Repeat steps 3.~6.

Note:

Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION
Modulation 30%
Modulation frequency.....400Hz



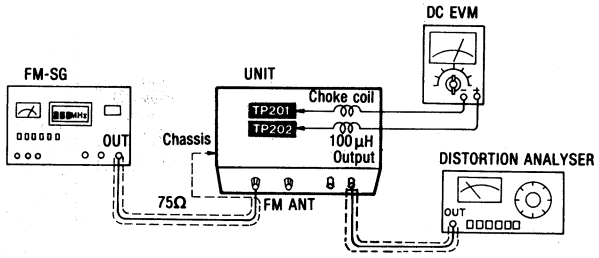
FM MONO DISTORTION ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**FM**" position.
3. Place the radio frequency display and signal generator setting to **100.10MHz.**
4. Adjust **T202** core so that voltage measured in signal mode is **0mV (0±20mV)** in 300mV range.
5. Repeat steps 4 a few times.
6. Make sure that the distortion factors of Lch and Rch are nearly the same with each other to minimum.

Note:

The adjusting screwdriver used should be made of resin.

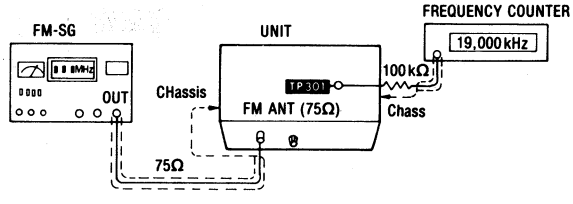
FM SIGNAL GENERATOR CONDITION
Modulation 100%
Modulation frequency.....400Hz
Output level.....66dB



MPX VCO ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**FM auto**" position.
3. Place the radio dial and signal genarator setting to **100.10MHz.**
4. Adjust **VR301** for **19kHz**±30 Hz on frequency counter reading.

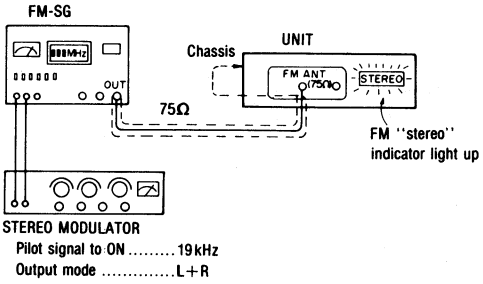
FM SIGNAL GENERATOR CONDITION
Modulation 0
Modulation frequency.....0
Output level.....66dB

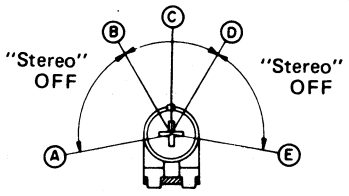


★ USING ALTERNATE SYSTEM

1. Apply stereo signal from generator or receive the stereo boardcast.
2. Adjust VR301 until stereo indicator lights up. Cement arm of VR301 as shown in figure.

FM SIGNAL GENERATOR CONDITION
Modulation 10%
Modulation frequency.....Pilot (19kHz)
Output level.....66dBμ

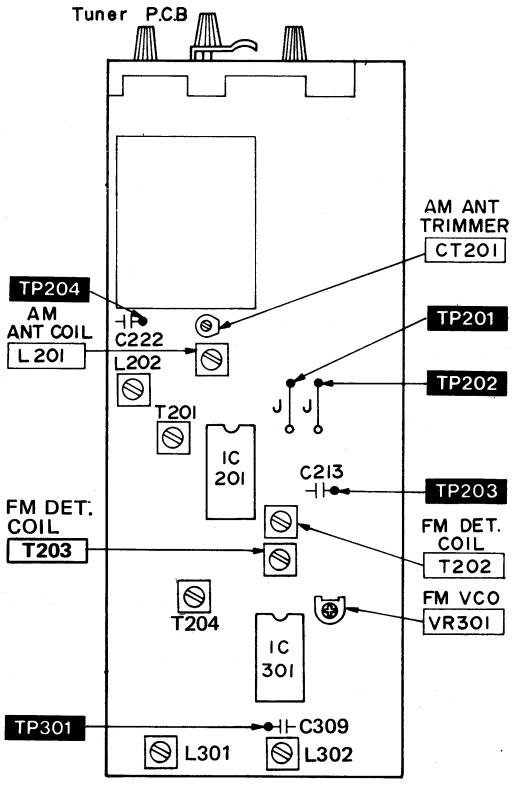




VR301

Ⓐ—Ⓑ,
Ⓓ—Ⓔ.....“Stereo” OFF position.
Ⓑ—Ⓓ.....“Stereo” ON position. (Indicator lighting)
Ⓒ.....Adjust point of pilot circuit.

• Adjustment points



■ FUNCTION OF TERMINAL

• IC901 (LC6512A3377)

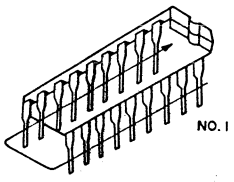
PIN NO.	MARK	DISCRIPTION OF TERMINAL
1	PB3	Computer drive input terminal.
2 ∫ 4	PC0 ∫ PC2	Control output terminal for IC902 (LM7001).
5 6	PC3 NC	Not used.
7	PDϕ	Auto/mono changeover output terminal. (auto → 0V, mono → 5V)
8 ∫ 10 11	PD1 ∫ PD3 PE0	Not used.
12 ∫ 14 22 ∫ 25	PE1 ∫ PE3 PF0 ∫ PF3	Digital signal output terminal for display. Output terminal for key return signal to external key matrix.
15	$\overline{RES}$	Reset terminal.
16 17	TEST V_{SS}	Ground terminal.
18 19	NC NC	Not used.
20 21	OSC1 OSC2	Connecting terminal for crystal oscillator. The crystal connected is 1MHz.
26 ∫ 29 31 ∫ 34	PG0 ∫ PG3 PH0 ∫ PH3	Segment signal output terminal for display.
30	NC	Not used.
35	PI0	Control signal output terminal for relay (RLY701).
36	PI1	Muting signal output. (Muting → High level)
37	$\overline{HOLD}$	Input terminal for power failure detection.
38	$\overline{INT}$	Input terminal for remote control cord.
39	V_{DD}	Power supply terminal of device. Voltage of 5V is supplied during operation of device.
40 41 44 45	PA0 PA1 PA2 PA3	Input terminal for key return signal to external key matrix. [KEY MATRIX] Pin No. / 45 / 44 / 41 / 40 14 / CH4 / CH3 / CH2 / CH1 22 / — / — / AM / FM 23 / — / — / CH0 / CH9 24 / CH8 / CH7 / CH6 / CH5 25 / MODE / MEMORY / UP / DOWN
46	PB0	Stereo signal input.
47	PB1	SD signal input.
48	PB2	Tuner select input.

• IC501 (TC9177P) Attenuator

Pin No.	Mark	Description
1	V_{SS}	Power supply (negative).
2, 3 18, 19	CH1-Loudness 1,2 CH2-Loudness 1,2	Loudness terminal.
4 17	CH1-OUT 1 CH2-OUT 1	10dB attenuator output. Signal via IN is attenuated by 8 steps, 10dB each, from 0 ~ 70dB.
5 16	CH1-IN 1 CH2-IN 1	10dB attenuator input.
6 15	A-GND	AC grounding terminal.
7 14	CH1-IN 2 CH2-IN 2	2dB attenuator input.
8 13	CH1-OUT 2 CH2-OUT 2	2dB attenuator output. Signal via IN is attenuated by 5 steps, 2dB each, from 0 ~ 8dB.
9	GND	Grounding terminal.

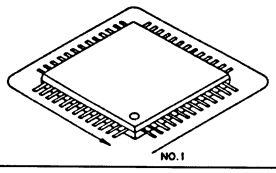
Pin No.	Mark	Description
10	CK	Clock input. Used to take in data at DATA pin.
11	DATA	Attenuation/channel select data input. 20-bits input activated by CK signal.
12	ST	Strobe input. Attenuation/channel select data from DATA and CK pins are lapped when this pin is at "H" level. Previous data remain the same while this pin does not reach "H" level.
20	V_{DD}	Power supply (positive).

■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

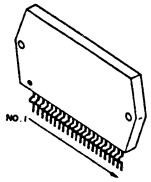


AN6558F	8PIN	M5226P	16PIN
AN6552	8PIN	SVIBA6148	16PIN
LM7001	8PIN	AN7273A	18PIN
M5238P	8PIN	TC9177P	20PIN
AM6554F	14PIN	TC9163N	28PIN
AM7470	16PIN	M50720-408SP	42PIN

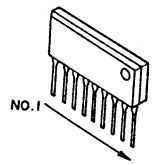
LC6512A-3377 (48PIN)
LC6513A-3264 (48PIN)



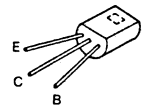
SVI3103 (18PIN)



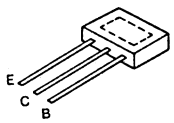
M5218L (8PIN)



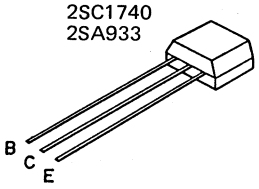
2SA992, 2SA684
2SC1845, 2SC1384



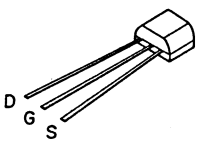
2SC3311, 2SC2785
2SC2787



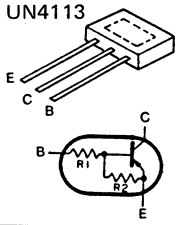
2SC1740
2SA933



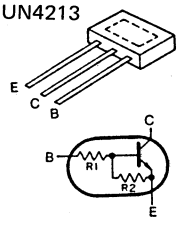
2SJ40CD



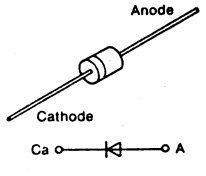
UN4111
UN4113

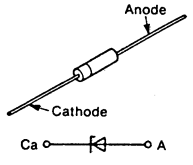


UN4211
UN4213



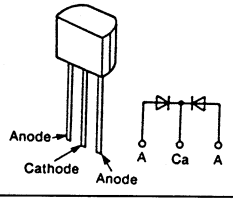
MA165, MA167
MA29WA, 1SS254



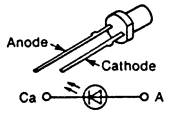


MA4030M, MA4051M
MA4062M, MA4075M
MA4082M, MA411oM
MA4160M, MA4300M
SVDS3V20

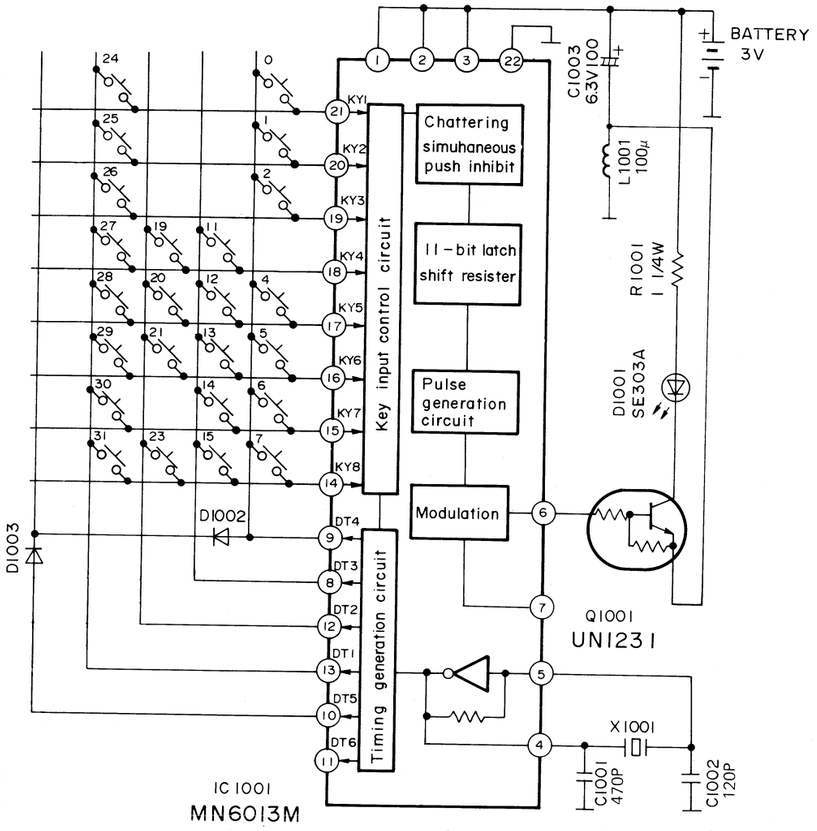
KV1260Z



SWV66



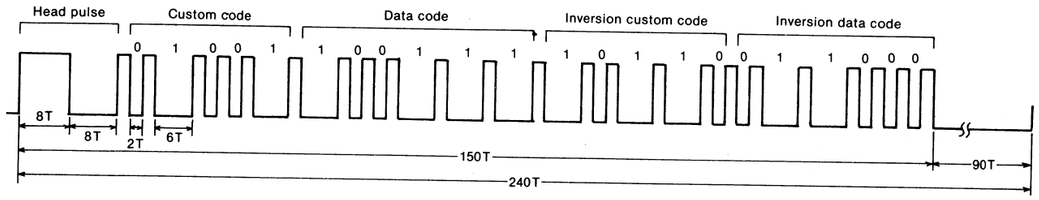
■ SCHEMATIC DIAGRAM OF REMOTE-CONTROL TRANSMITTER



D1002, 1003
MA154WK

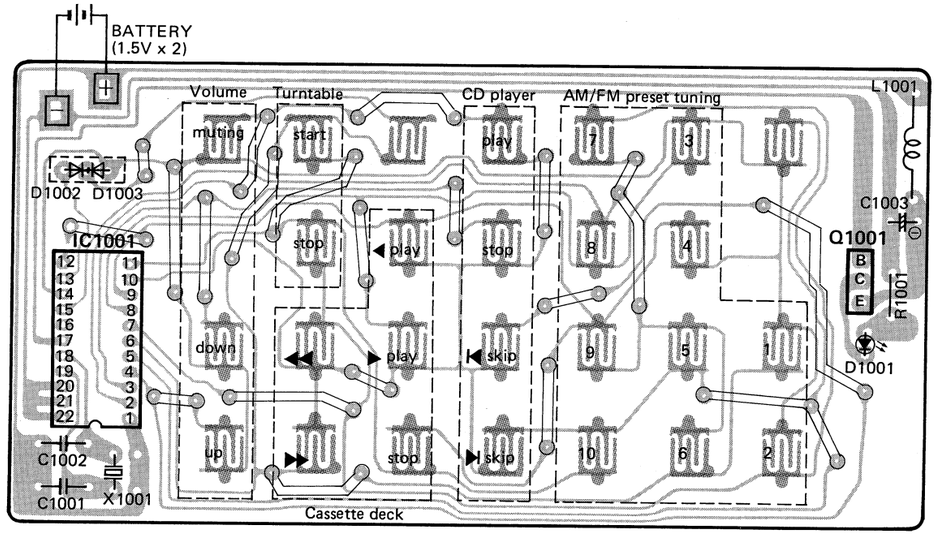
IC1001
MN6013M

• KEY NUMBER DESCRIPTION AND DATA CODE (Example key No. 0)

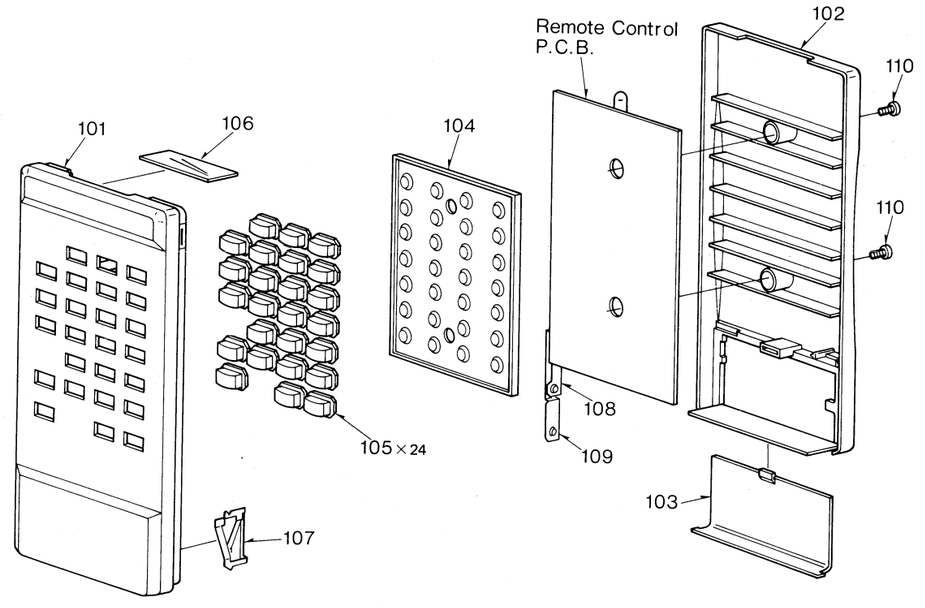


Key No.	Function	Custom code	Data code	Key No.	Function	Custom code	Data code
0	Muting	01001	100111	19	Preset tuning 0	01001	011001
1	Volume down	01001	100101	20	Turntable start	01001	001100
2	Volume up	01001	100100	21	Turntable stop	01001	001101
4	Preset tuning 1	01001	010000	23	Deck stop	01001	000000
5	Preset tuning 2	01001	010001	24	CD play	01100	001010
6	Preset tuning 3	01001	010010	25	CD stop	01100	000000
7	Preset tuning 4	01001	010011	26	CD ◀I skip	01100	000010
11	Preset tuning 5	01001	010100	27	CD ▶I skip	01100	000011
12	Preset tuning 6	01001	010101	28	Deck ▶▶	01001	000011
13	Preset tuning 7	01001	010110	29	Deck ◀◀	01001	000010
14	Preset tuning 8	01001	010111	30	Deck play ▶	01001	001010
15	Preset tuning 9	01001	011000	31	Deck play ◀	01001	001001

■ PRINTED CIRCUIT BOARD OF REMOTE-CONTROL TRANSMITTER



■ EXPLODED VIEW OF REMOTE-CONTROL TRANSMITTER

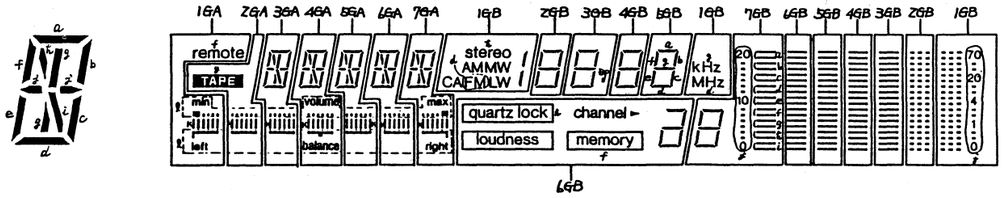


Ref. No.	Part No.	Description
I.C. (REMOTE CONTROL)		
IC1001	MN6013M	I.C.
TRANSISTORS (REMOTE CONTROL)		
Q1001	UN1231	TRANSISTOR
DIODES (REMOTE CONTROL)		
D1002, D1003	MA154WK	DIODE
COIL (REMOTE CONTROL)		
L1001	ELEA101JA	COIL
OSCILLATOR (REMOTE CONTROL)		
X1001	CSB420PB1	420 KHZ
RESISTORS (REMOTE CONTROL)		
D1001	LN66	L.E.D
R1001	ERDS2TJ1R0	CARBON, 1Ω, 1/4W

Ref. No.	Part No.	Description
CAPACITORS (REMOTE CONTROL)		
C1001	ECKD1H471KB	CERAMIC, 470PF, 50V
C1002	ECKD1H121KB	CERAMIC, 120PF, 50V
C1003	ECEA0GK101	ELECTROLYTIC, 100μF, 6.3V
REMOTE CONTROL TRANSMITTER		
100	UR64VCS312	TOP CASE
101	UR64VCS321	BOTTOM COVER
102	UR64EC121	COVER, BATTERY
103	UR64CT122	RUBBER, SWITCH
104	UR64BT123AA	BUTTON
105	UR64SB125	PLATE
106	UR52TD101	TERMINAL (COMMON)
107	UR64TD127	TERMINAL (+)
108	UR64TD128	TERMINAL (-)
109	XTS26+12GFZ	SCREW

■ DESCRIPTION OF FLUORESENT DISPLAY

GRID ASSIGNMENT



CONNECTION

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
CONNECTION	NP	F2	1jB	1GB	NP	NP	1aB	2GB	1bB	3GB	1cB	4GB	1dB	1eB	5GB	1fB	6GB	1gB	7GB	1hB	1iB	NC	NC	CH	2hB	AM	2fB	MW	CA	NP	2cB	LW	2aB	2eB	2dB

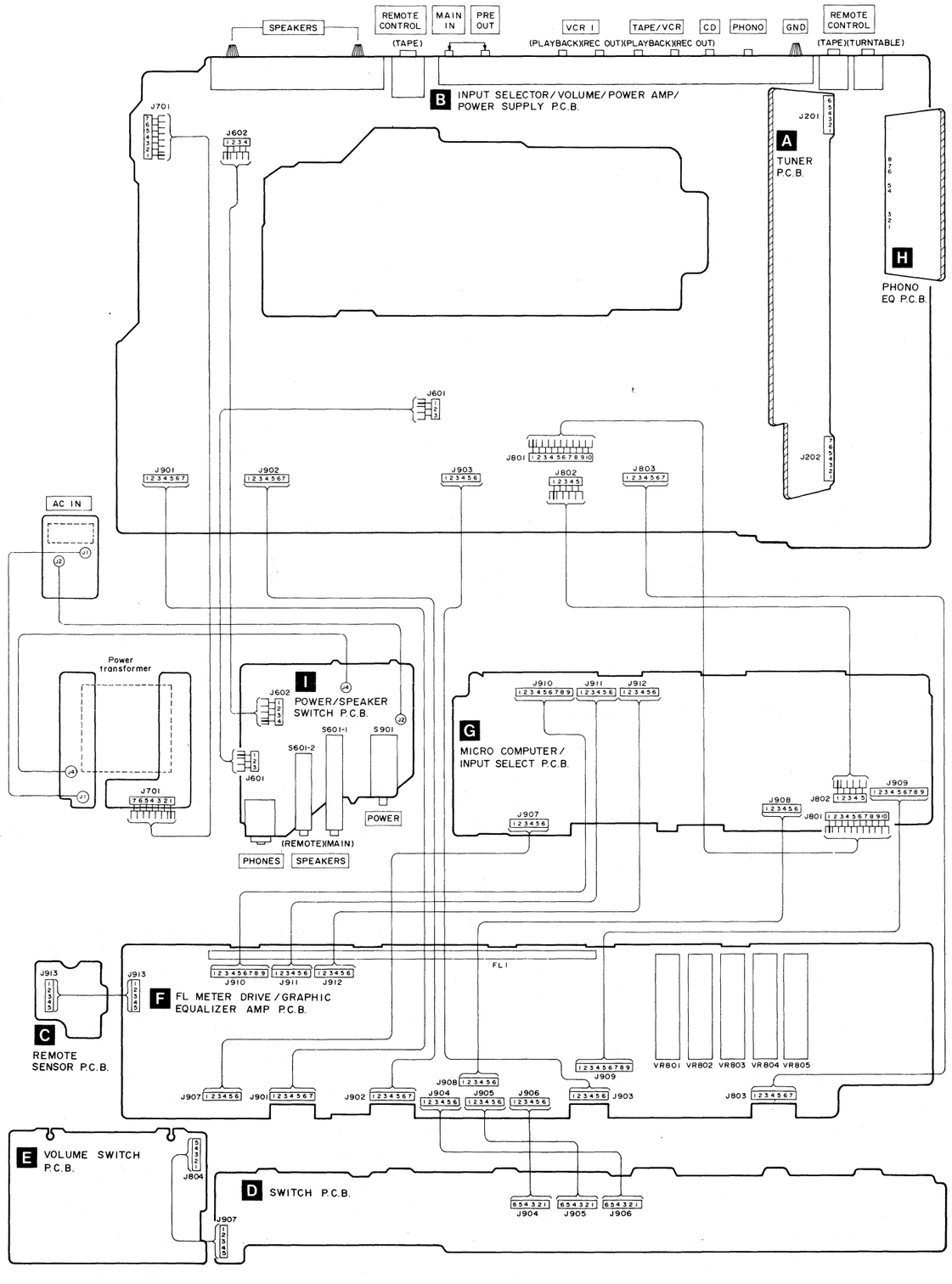
PIN NO.	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
CONNECTION	NP	2gB	2bB	NP	NP	loudness	NP	gA	7GA	cA	6GA	iA	eA	5GA	dA	kA	4GA	jA	3GA	fA	hA	bA	2GA	aA	ℓA	1GA	F1	NP

ANODE CONNECTION

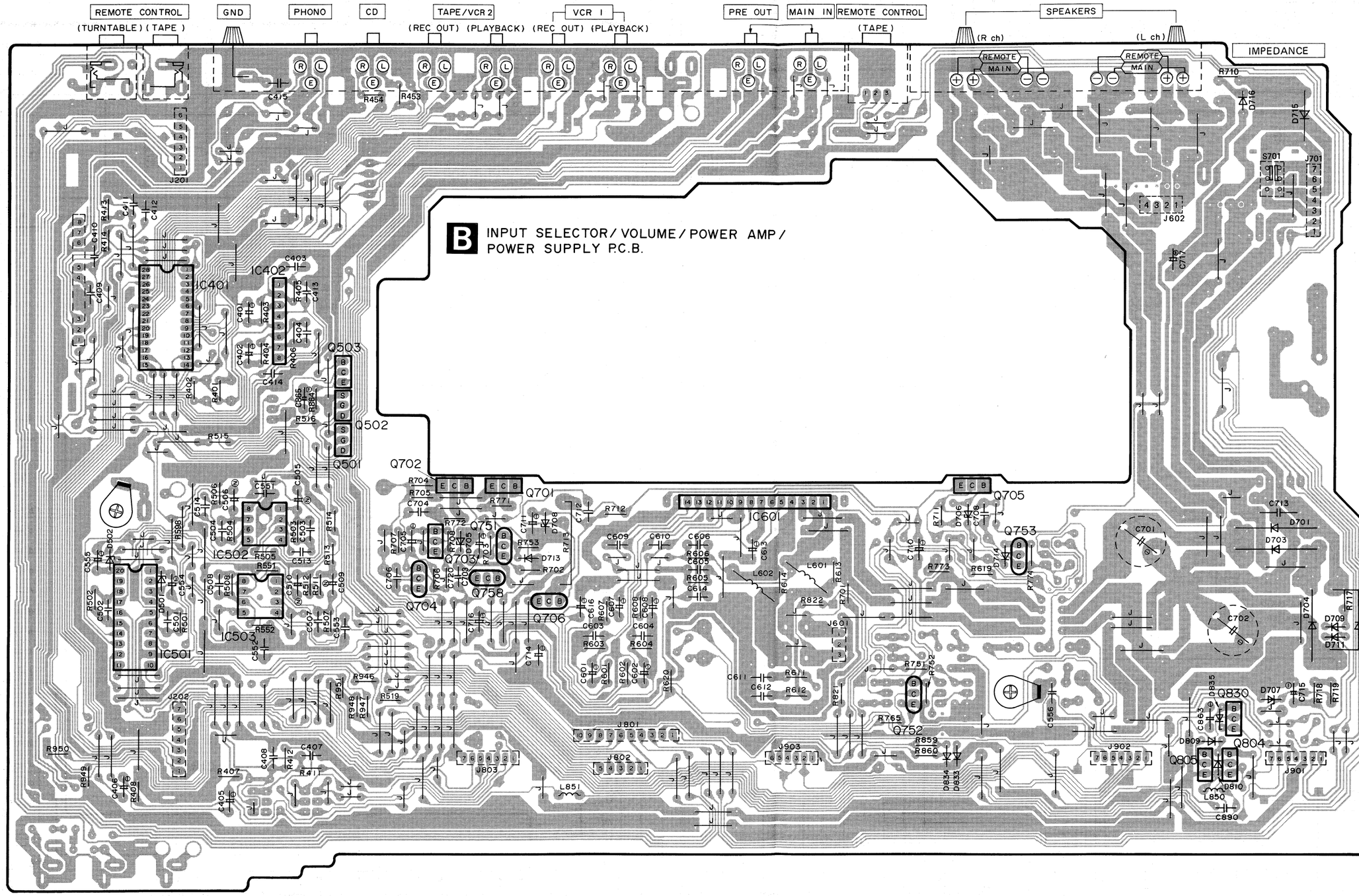
	1GA	2GA	3GA	4GA	5GA	6GA	7GA
aA	-	-	a	a	a	a	a
bA	-	-	b	b	b	b	b
cA	-	-	c	c	c	c	c
dA	-	-	d	d	d	d	d
eA	-	-	e	e	e	e	e
fA	remote	-	f	f	f	f	f
gA	-	TAPE	g	g	g	g	g
hA	-	-	h	h	h	h	h
iA	-	-	i	i	i	i	i
jA	-	-	j	j	j	j	j
kA							
ℓA	min / left			volume / balance			max / right

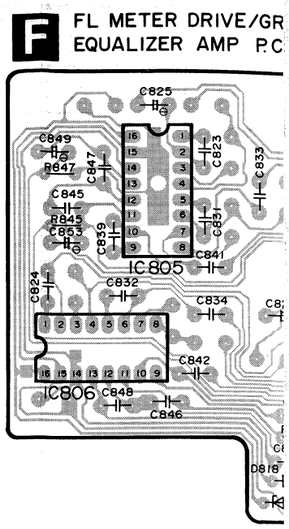
	1GB	2GB	3GB	4GB	5GB	6GB	7GB
1aB	-			-			-
1bB	-			-			-
1cB	-			-			-
1dB	-			-			-
1eB	-			-			-
1fB	-			-			-
1gB	-			-			-
1hB	-			-			-
1iB	-			-			-
1jB	1jB	-	-	1jB	-	-	1jB
2aB	/	a	a	a	a	a	a
2bB	-	b	b	b	b	b	b
2cB	-	c	c	c	c	c	c
2dB	FM, MHz	d	d	d	d	d	d
2eB	-	e	e	e	e	e	e
2fB	-	f	f	f	f	memory	f
2gB	kHz	g	g	g	g	g	g
2hB	stereo	-	DP	-	-	quartz lock	-
AM	AM	-	-	-	-	-	-
MW	MW	-	-	-	-	-	-
CA	CA	-	-	-	-	-	-
LW	LW	-	-	-	-	-	-
CH	-	-	-	-	-	channel ▶	-
loudness	-	-	-	-	-	loudness	-

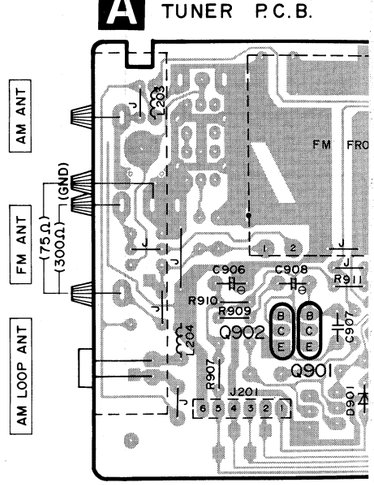
■ WIRING CONNECTION DIAGRAM

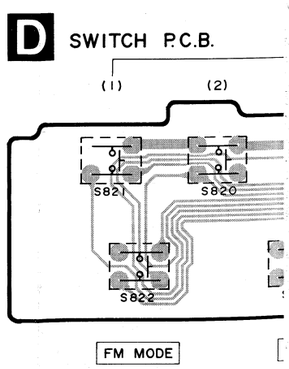


■ PRINTED CIRCUIT BOARDS



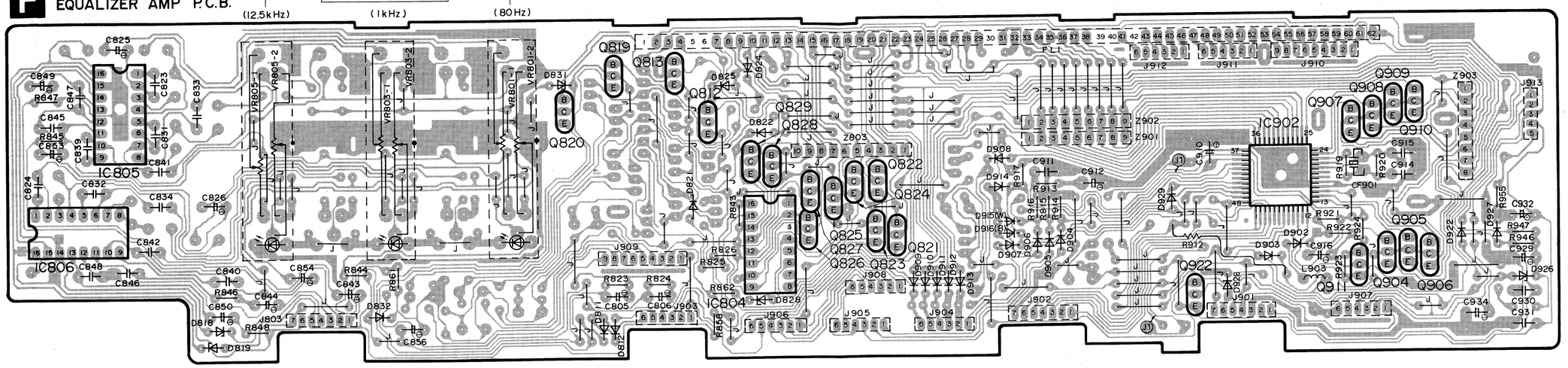




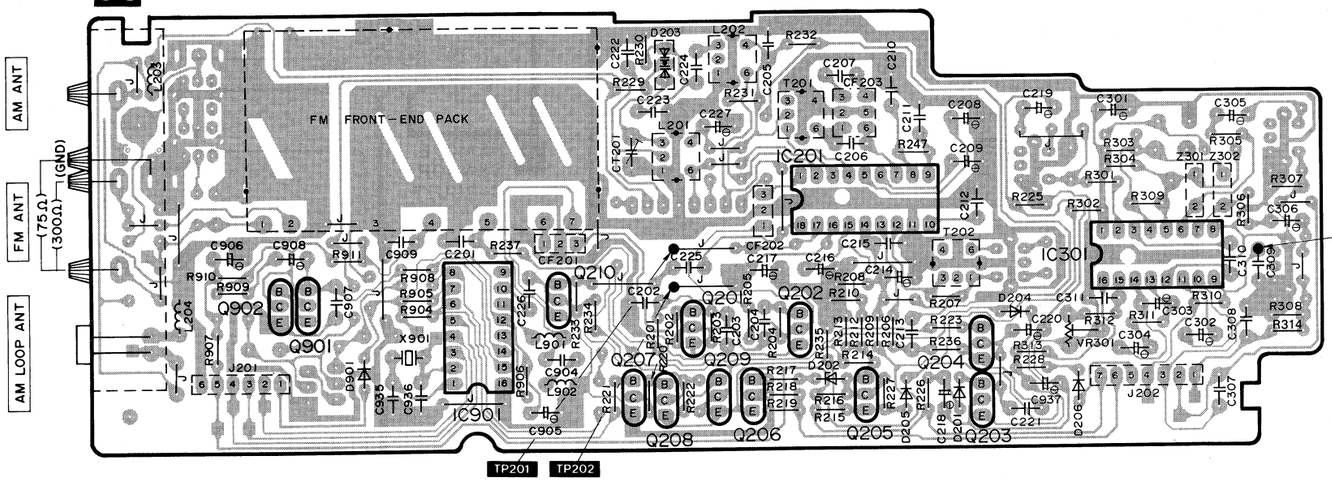


F FL METER DRIVE/GRAPHIC EQUALIZER AMP P.C.B.

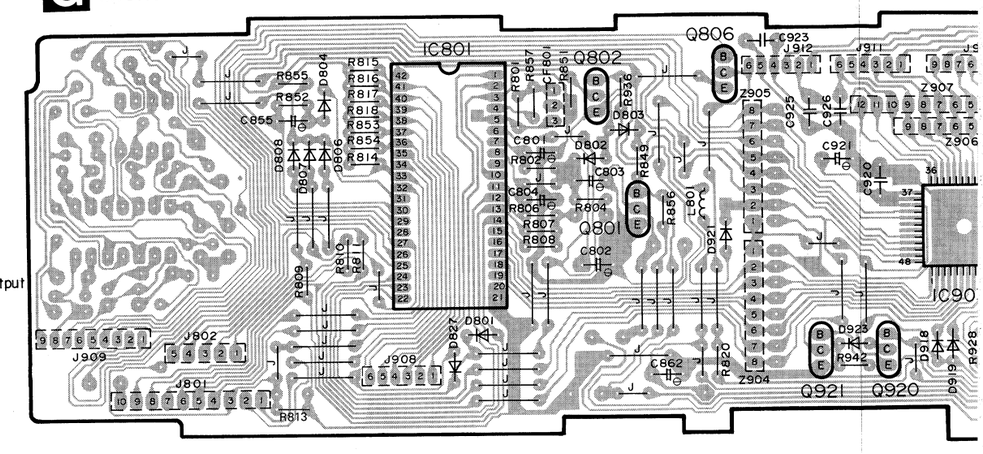
GRAPHIC EQUALIZER (12.5kHz) (1kHz) (80Hz)



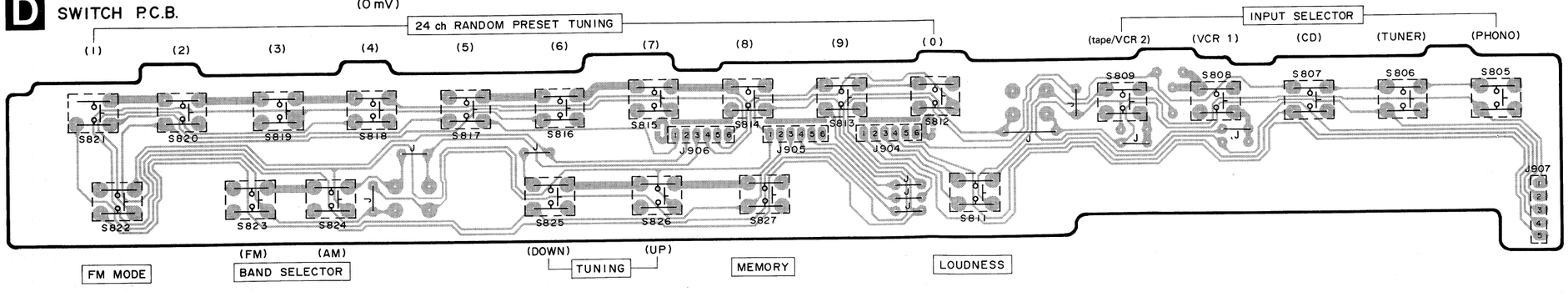
A TUNER P.C.B.



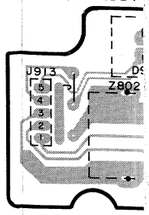
G MICRO COMPUTER/INPUT SELECT P.C.B.



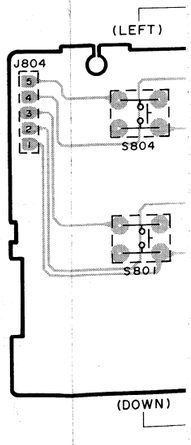
D SWITCH P.C.B.

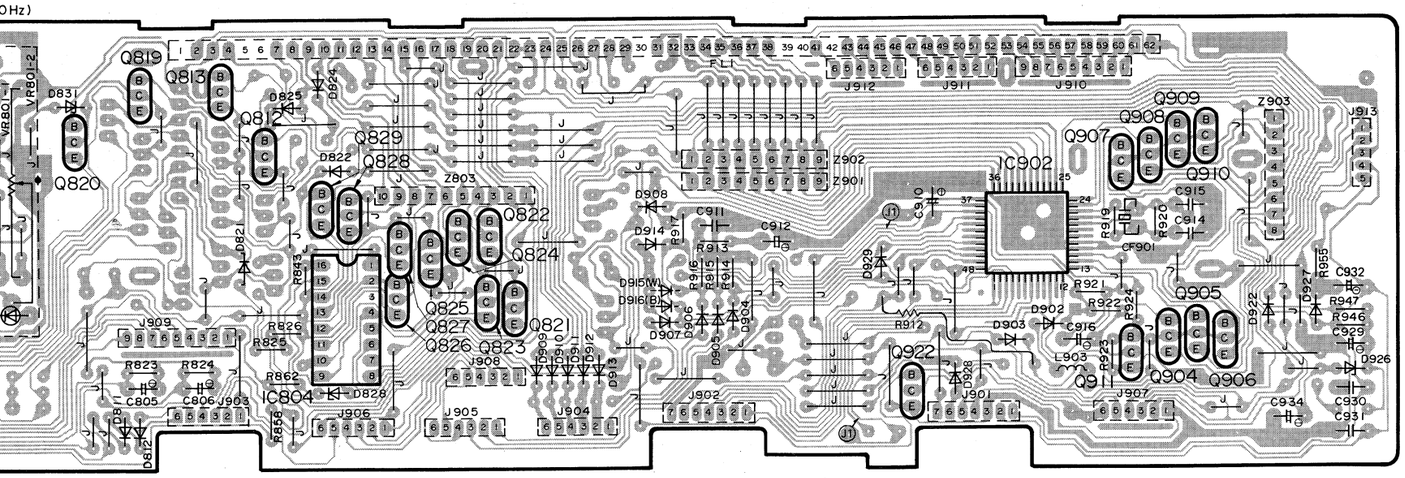

24 ch RANDOM PRESET TUNING
(1) (2) (3) (4) (5) (6) (7) (8) (9) (0)
INPUT SELECTOR
(tape/VCR 2) (VCR 1) (CD) (TUNER) (PHONO)
S821 S820 S819 S818 S817 S816 S815 S814 S813 S812
S809 S808 S807 S806 S805
S822 S823 S824 S825 S826 S827 S811
J906 J905 J904 J807
(FM) (AM)
(DOWN) (UP)
FM MODE
BAND SELECTOR
TUNING
MEMORY
LOUDNESS

C REMOTE SENS P.C.B.

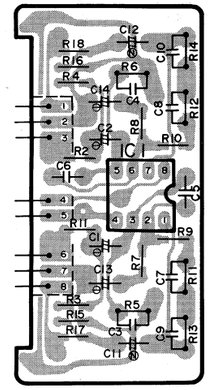


E VOLUME SW

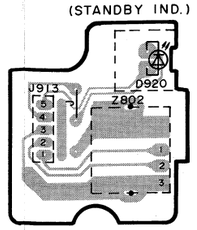




H PHONO EQUALIZER P.C.B.

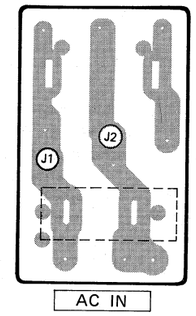


(STANDBY IND.)



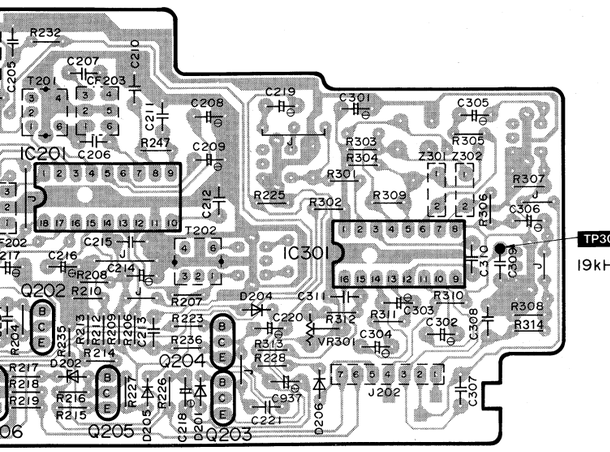
C REMOTE SENSOR P.C.B.

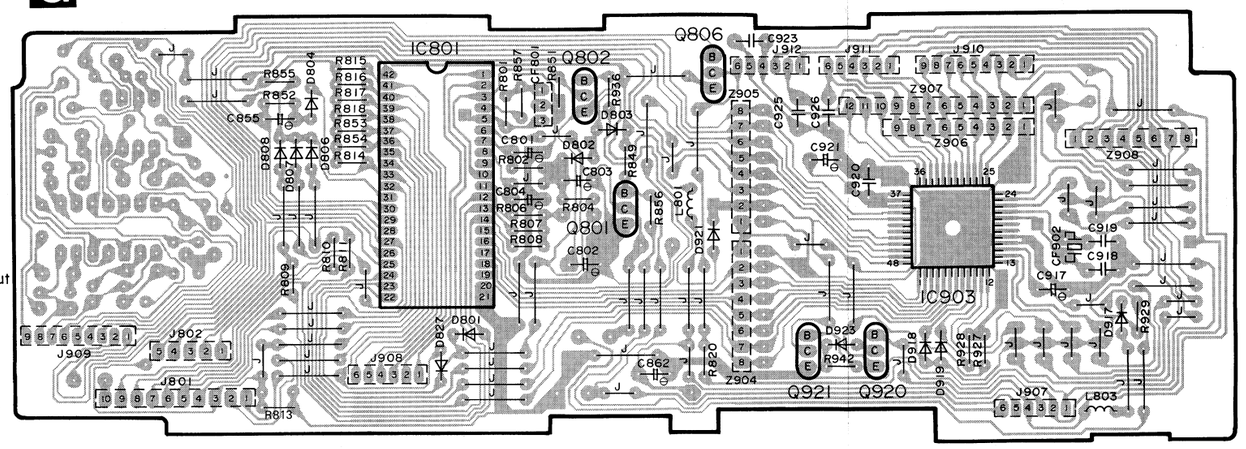
REMOTE SENSOR

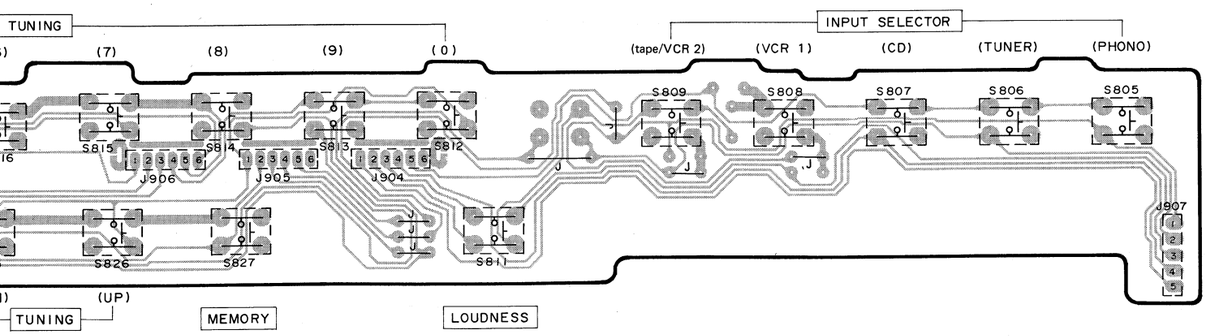


AC IN

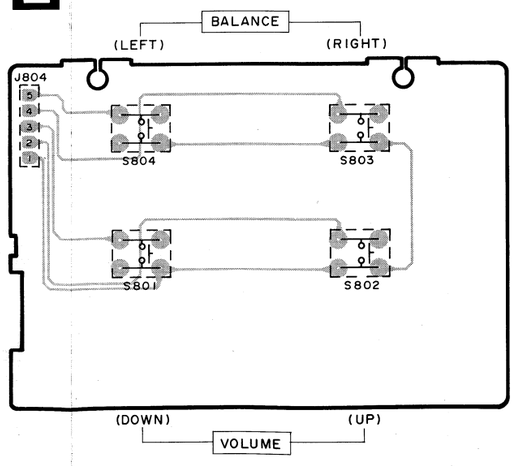
G MICRO COMPUTER/INPUT SELECT P.C.B.

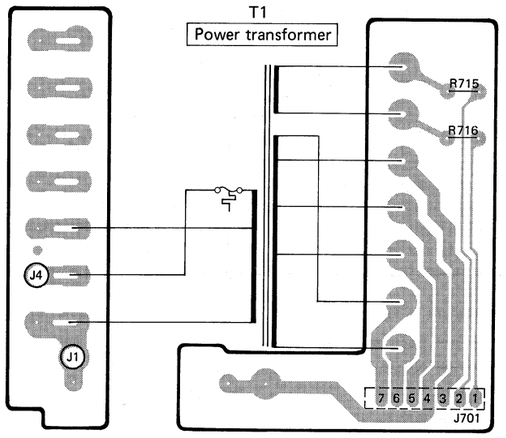




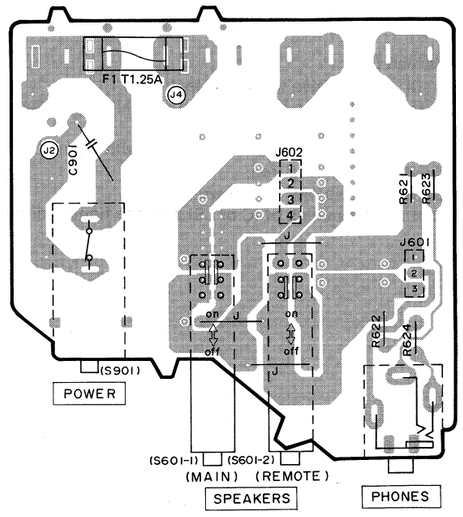


E VOLUME SWITCH P.C.B.





I POWER/SPEAKER SWITCH P.C.B.



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Note 1:

1. S601–1 : Main speaker switch in **"ON"** position. (▂ on, ▁ off)
2. S601–2 : Remote switch in **"OFF"** position. (▂ on, ▁ off)
3. S701 : Impedance selector switch in **"8Ω"** position.
4. S801, 802 : Volume control switch. (S801: down, S802: up)
5. S803, 804 : Balance control switch. (S803: right, S804: left)
6. S805～810 : Input selector in **"tuner"** position.
   [S805: phono, S806: tuner, S807: CD
   S808: VCR 2, S809: VCR 1, S810: tape]
7. S811 : Loudness switch in **"OFF"** position.
8. S812～821 : AM/FM Random preset tuning.
   [S812: 0 S813: 1 S814: 2 S815: 3
   S816: 4 S817: 5 S818: 6 S819: 7
   S820: 8 S821: 9]
9. S822 : FM mode selector switch in **"auto"** position.
10. S823, 824 : Band selector switch in **"FM"** position.
11. S825, 826 : Tuning selector switch.
    (S825: down, S826: up)
12. S827 : Memory switch in **"OFF"** position.
13. S901 : Power switch in **"ON"** position.
14. Direct equalizer level control key matrix circuit includes switches that "vary all frequencies in the range of ± 10dB".
15. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
    * Figures in ( ) stand for DC voltage in AM signal reception mode.

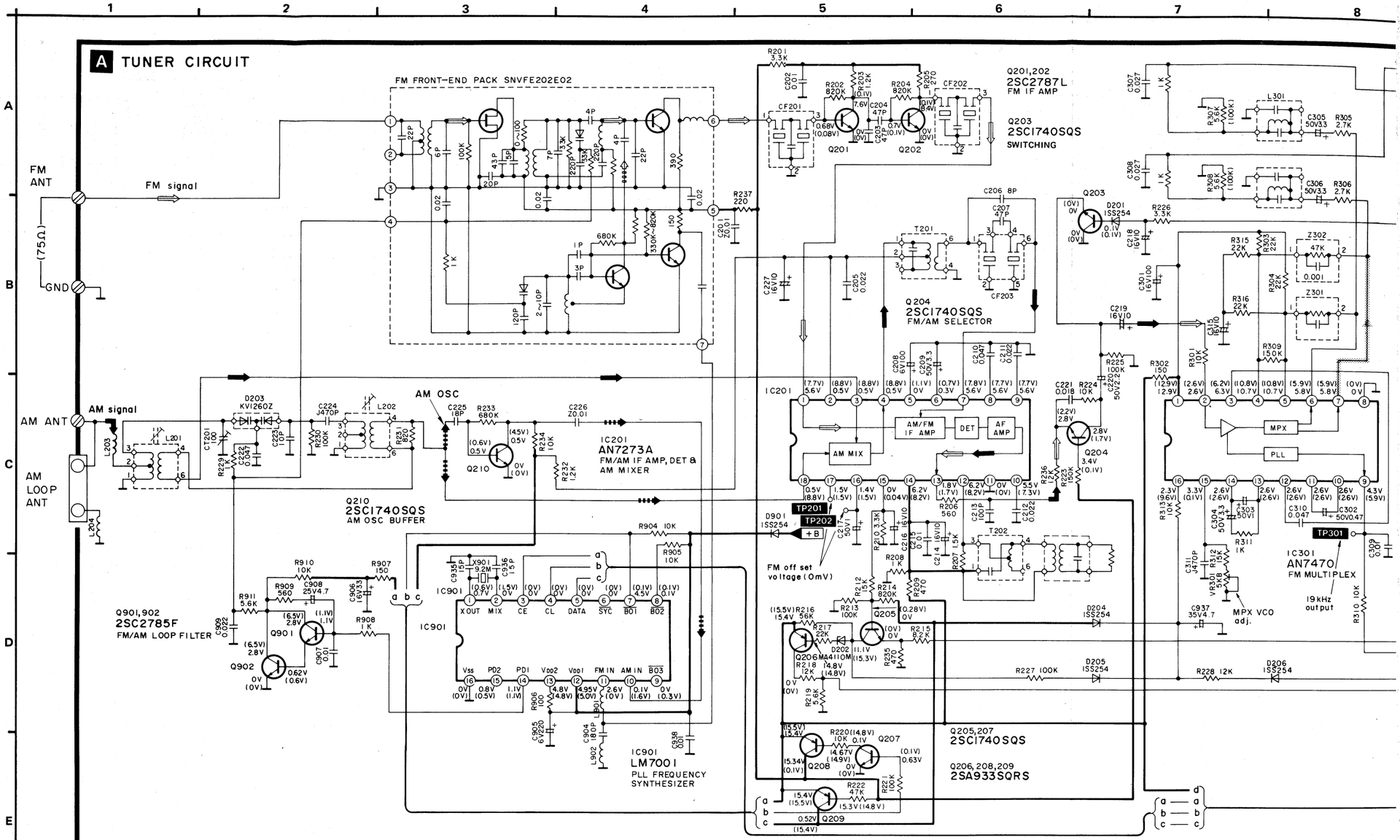
    ——— Positive voltage lines ▒▒▒ AF signal lines
    – – – Negative voltage lines ▭▭▭▷ FM OSC
    ═══▷ FM signal ■■■■▶ AM OSC
    ▬▬▶ AM signal

16. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

*** Caution!**

IC and LSI are sensitive to static electricity.
Sencondary trouble can be prevented by taking care during repair.

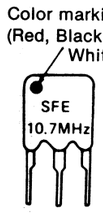
- *** Cover the parts boxes made of plastics with aluminum foil.**
- *** Ground the soldering iron.**
- *** Put a conductive mat on the work table.**
- *** Do not touch the legs of IC or LSI with the fingers directly.**



Note2:

• Use of ceramic filters in pairs

The ceramic filters (CF201, CF203) for FM-IF circuit are available in three ranks. For this circuit, be sure to use the ceramics of the same rank in a pair.
At repairing and replacement, pay close attention to the diodes (D909, D910) for use as different diodes must be used depending on each rank of the ceramic filters.



RANK (Color)	D909	D910	CENTER FREQUENCY
Black	○	×	10.65MHz
Red	×	×	10.70MHz
White	×	○	10.75MHz

Note: ○ mark: Diode is used.
× mark: Diode is not used.

AF signal

Q201,202
2SC2787L
FM IF AMP

Q203
2SCI740SQS
SWITCHING

Q204
2SCI740SQS
FM/AM SELECTOR

IC201
AM/FM IF AMP
DET
AF AMP
AM MIX

IC301
MPX
PLL

IC301
AN7470
FM MULTIPLEX

TP201
TP202
TP301

FM off set voltage (OmV)

19kHz output

MPX VCO adj.

Q205,207
2SCI740SQS

Q206,208,209
2SA933SQRS

C REMOTE SENSOR CIRCUIT

SWV66
D920
(standby ind.)
Z802

Q911
2SCI740
SWITCHING

IC902
LC6512A-3312
MICRO-COMPUTER

Q904~910
2SCI740
SWITCHING

Q907
Q908
Q909
Q910

Q804,830
UN4113
SWITCHING

Q805
UN4215
SWITCHING

Q804
Q805

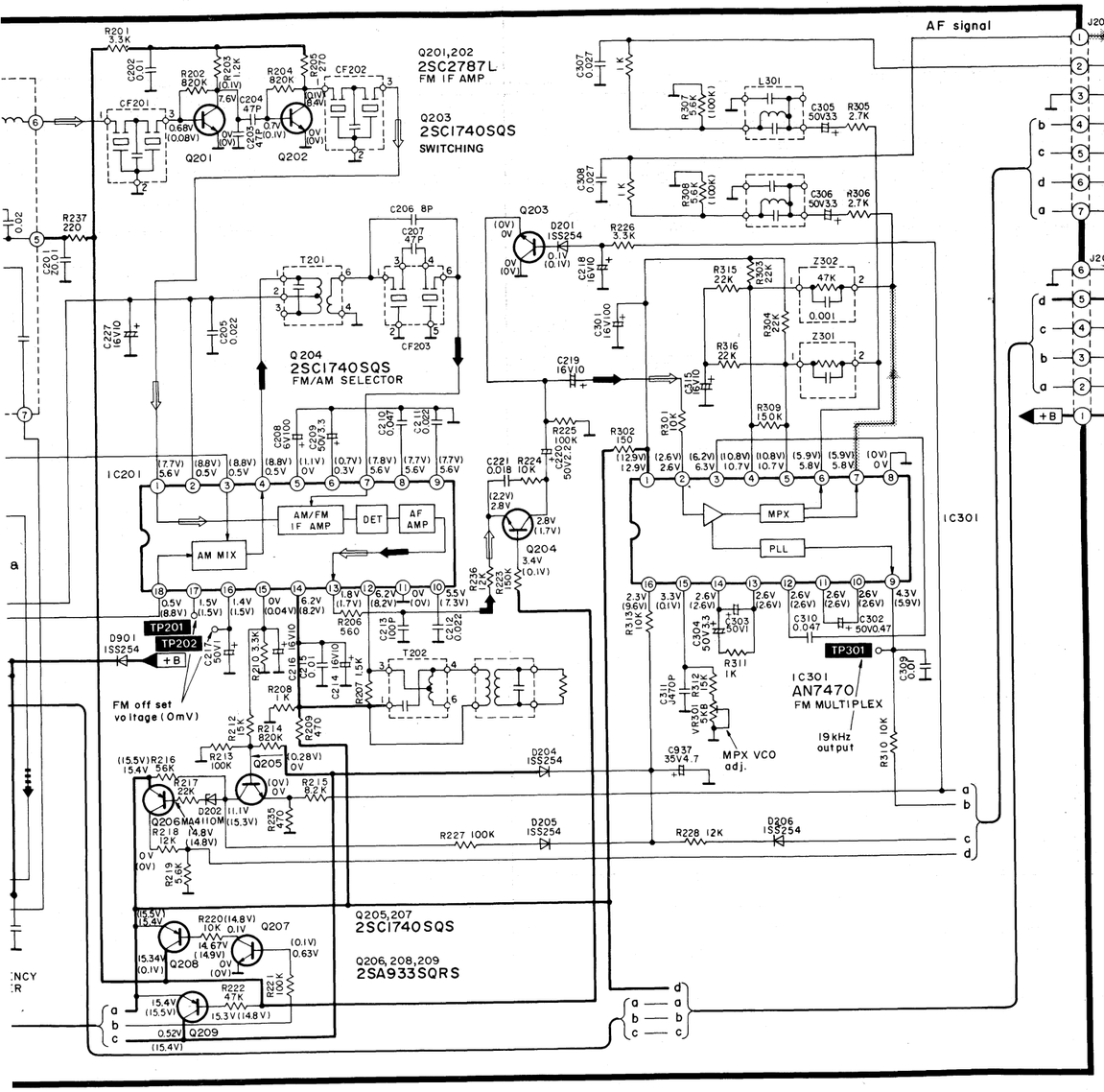
Q922
UN4213

Q812,813
UN4213
SWITCHING

Q819,820
UN4115
SWITCHING

FM MODE
S822

CH4
S818
CH8
S814


AF signal
Q201,202
2SC2787L
FM IF AMP
Q203
2SC1740SQS
SWITCHING
Q204
2SC1740SQS
FM/AM SELECTOR
IC201
AM/FM IF AMP
DET
AF AMP
AM MIX
IC301
MPX
PLL
IC301
AN7470
FM MULTIPLEX
19kHz output
MPX VCO adj.
TP201
TP202
TP301
+B
FM off set voltage (0mV)
Q205,207
2SC1740SQS
Q206,208,209
2SA933SQRS
Q209
J202
J201
J901
J902
J903
J905
Q804,830
UN4113
SWITCHING
Q805
UN4215
SWITCHING
Q804
Q805
Q830
Q922
UN4213
C REMOTE SENSOR CIRCUIT
SWV66
D920
(standby ind.)
Z802
Q911
2SC1740
SWITCHING
IC902
LC6512A-3312
MICRO-COMPUTER
Q904~910
2SC1740
SWITCHING
Q907
Q908
Q909
Q910
Q812,813
UN4213
SWITCHING
Q819,820
UN4115
SWITCHING
Z901 (330P x 8)
Z902 (100K x 8)
Z903 (100K x 7)
FL1
F2
LM
AM
FM MODE
CH4
CH8

Q830 Q804 Q805 Q804,830 UN4113 SWITCHING Q805 UN4215 SWITCHING

D SWITCH CIRCUIT

E VOLUME SWITCH CIRCUIT

IC805,806 M5226P

F FL METER DRIVE/GRAPHIC EQUALIZER AMP. CIRCUIT

Q911 2SC1740 SWITCHING

IC902 LC6512A-3312 MICRO-COMPUTER

Q904~910 2SC1740 SWITCHING

Q922 UN4213

Q812,813 UN4213 SWITCHING

Q819,820 UN4115 SWITCHING

Q813 Q820 Q812 Q819

COMPARATOR

IC804 SVIBA6148

Q821~829 UN4115

IC805

IC806

B INPUT SELECTOR/VOLUME/POWER AMP/POWER SUPPLY CIRCUIT

G MICRO COMPUTER /INPUT SELECT CIRCUIT

IC801
M50270-408SP
MICRO-COMPUTER

IC903
LC6513A-3264
MICRO-COMPUTER

Q802,806,920
UN4211
SWITCHING

Q801
2SC1740

IC1
AN6558F
PHONO EQUALIZER

H PHONO EQ CIRCUIT

B INPUT SELECTOR/VOLUME/POWER AMP/POWER SUPPLY CIRCUIT

G MICRO COMPUTER /INPUT SELECT CIRCUIT

H PHONO EQ CIRCUIT

IC801
M50270-408SP
MICRO-COMPUTER

IC903
LC6513A-3264
MICRO-COMPUTER

Q802,806,920
UN4211
SWITCHING

Q801
2SC1740

IC1
AN6558
PHONO
EQUALIZER

(TURNTABLE) REMOTE CONTROL

(TAPE) REMOTE CONTROL

(TAPE) REMOTE CONTROL

GND

CD L ch R ch

TAPE/EXT PLAYBACK L ch R ch REC OUT L ch R ch

VCR1 PLAYBACK L ch R ch REC OUT L ch R ch

PRE OUT L ch R ch

MAIN IN L ch R ch

PHONO L ch R ch

IC401
TC9163N
INPUT SELECTOR

IC502
M5238P
BUFFER AMP

IC601
SVII3102A
POWER AMP

IC501
TC9177P
ATTENUATOR
(VOLUME CONT.)

IC402
M5218L
BUFFER AMP.

IC1
AN6558F
PHONO
EQUALIZER

IC503
M5238P
BUFFER AMP

Q701,702
2SD1265
REGULATOR

Q706,758
2SA684
REGULATOR

Q704
2SC1384
REGULATOR

Q751
2SA1309A
REGULATOR

Q705
2SB941
REGULATOR

Q752
2SC3311A
REGULATOR

Q501,502
2SK381
MUTING

Q503
2SA1309A
SWITCHING

GND
CD L ch
CD R ch
PLAYBACK L ch
PLAYBACK R ch
TAPE/EXT
REC OUT L ch
REC OUT R ch
PLAYBACK L ch
PLAYBACK R ch
VCRI
REC OUT L ch
REC OUT R ch
PRE OUT L ch
PRE OUT R ch
MAIN IN L ch
MAIN IN R ch
PHONO L ch
PHONO R ch

H PHONO EQ CIRCUIT

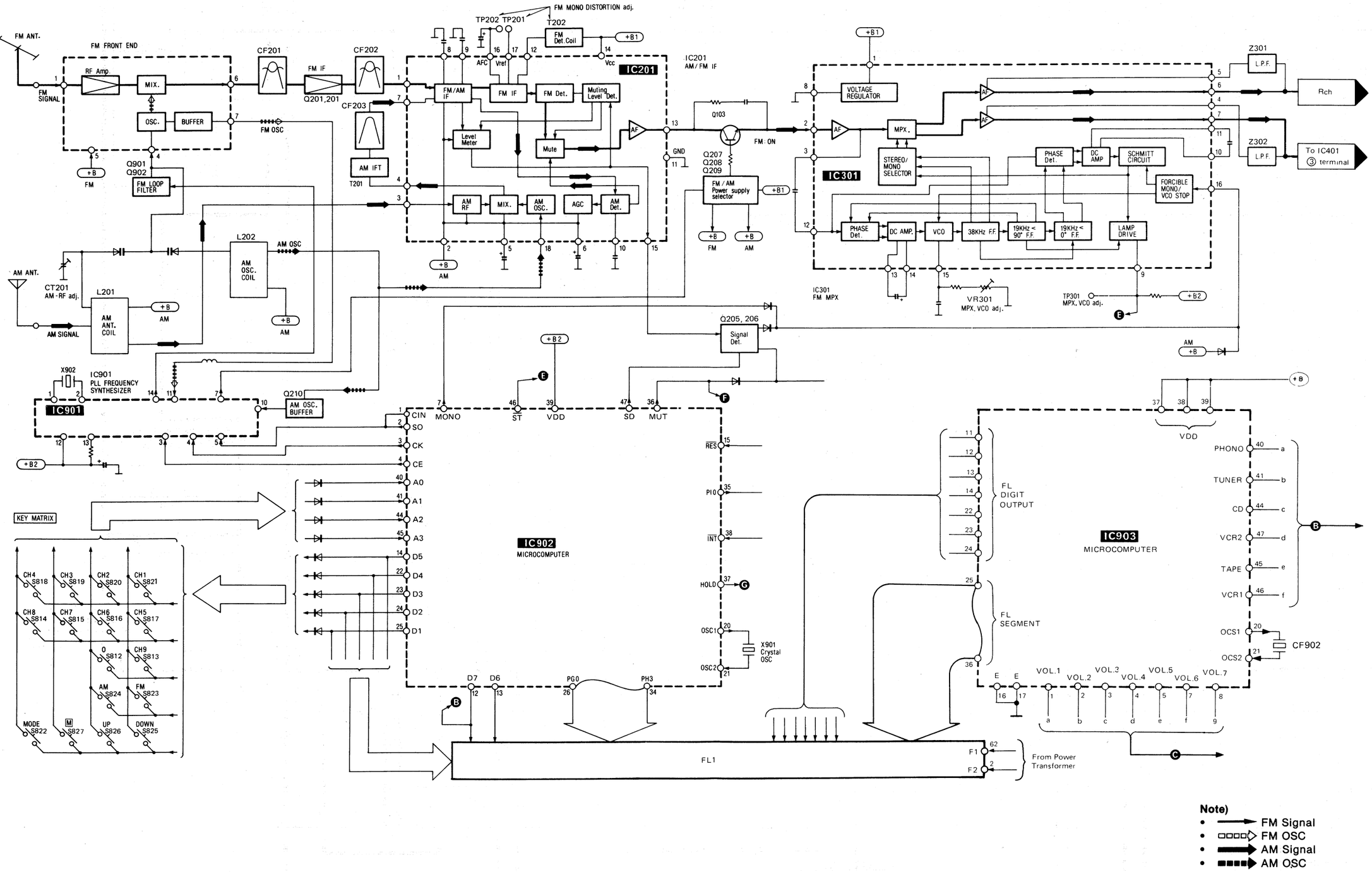
HEADPHONES
S601-2 (REMOTE)
S601-1 (MAIN)
SPEAKERS
MAIN L ch
MAIN R ch
REMOTE L ch
REMOTE R ch

I POWER/SPEAKER SWITCH CIRCUIT
S901 (POWER)
AC220V(EX,EH) 240V(XL) 50/60Hz

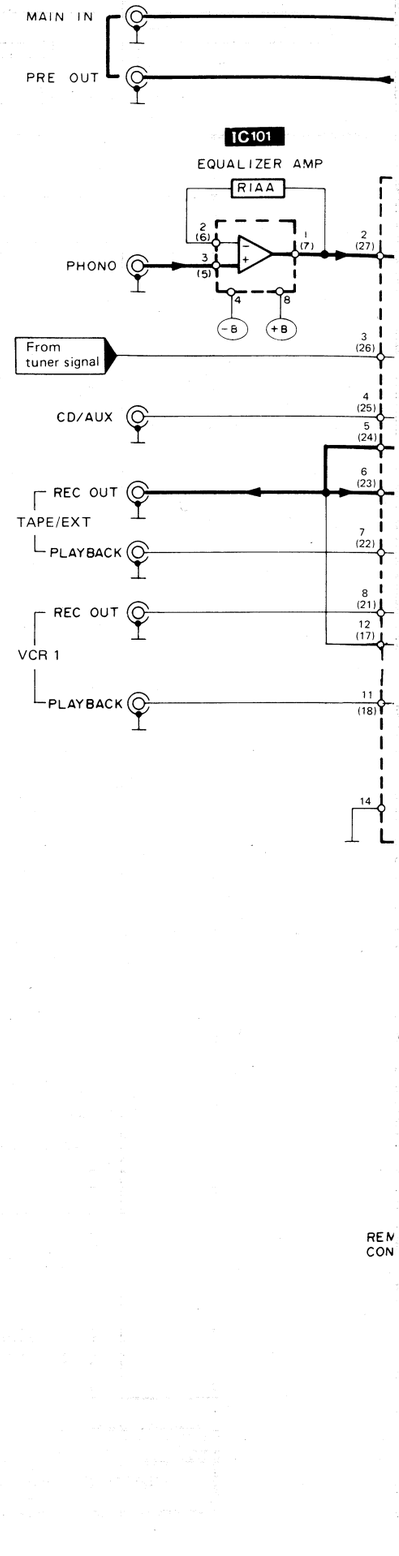
(IMPEDANCE) S701

■ BLOCK DIAGRAM

• Tuner



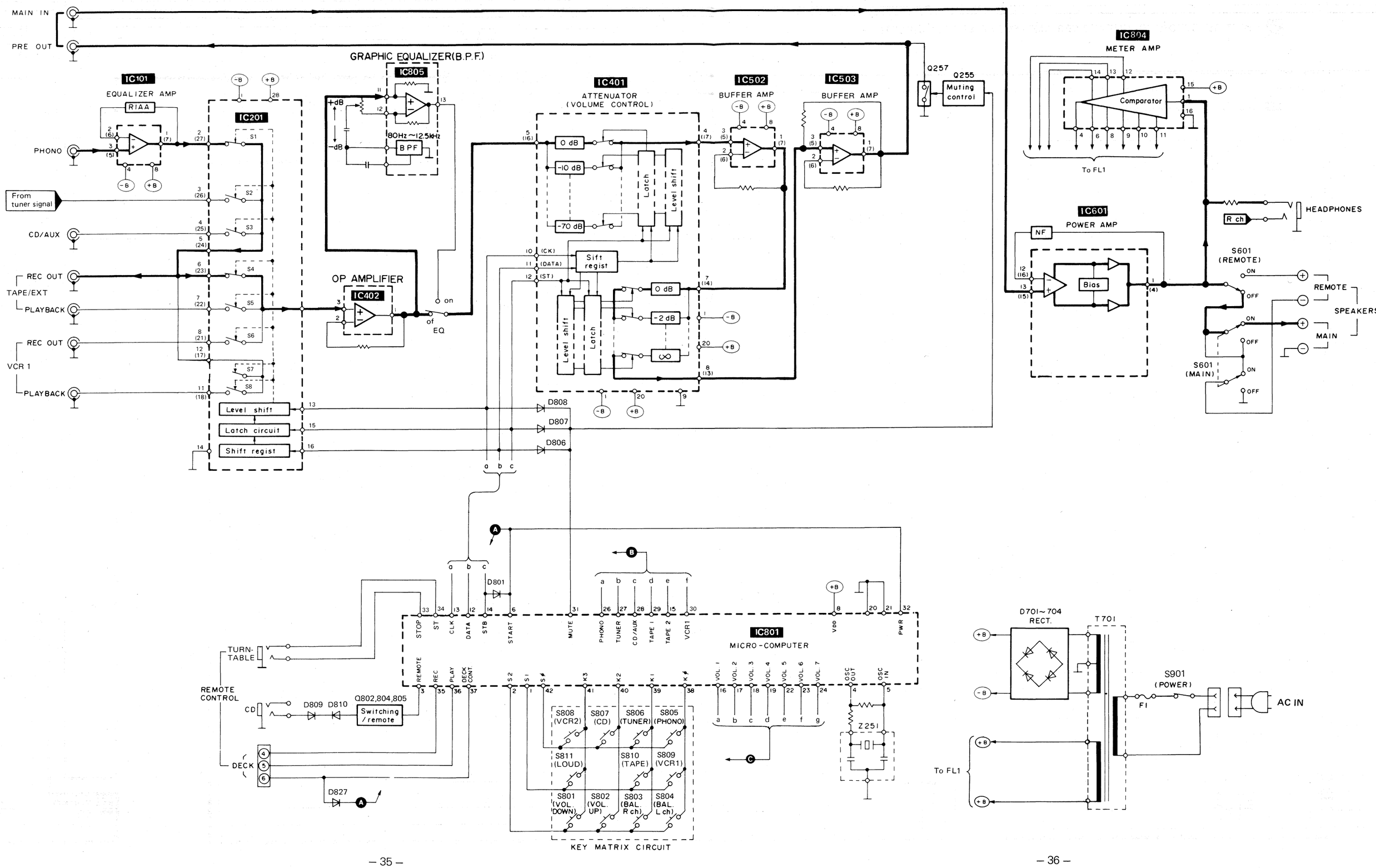
• Amplifier



Note)

- FM Signal
- FM OSC
- AM Signal
- AM OSC

• Amplifier


MAIN IN
PRE OUT
GRAPHIC EQUALIZER(B.P.F.)
IC101
EQUALIZER AMP
RIAA
PHONO
From tuner signal
CD/AUX
REC OUT
TAPE/EXT
PLAYBACK
REC OUT
VCR 1
PLAYBACK
IC201
S1
S2
S3
S4
S5
S6
S7
S8
Level shift
Latch circuit
Shift regist
IC805
80Hz~12.5kHz
BPF
+dB
-dB
OP AMPLIFIER
IC402
on
of
EQ
IC401
ATTENUATOR
(VOLUME CONTROL)
0 dB
-10 dB
-70 dB
Latch
Level shift
Sift regist
-2 dB
IC502
BUFFER AMP
IC503
BUFFER AMP
Q257
Q255
Muting control
IC804
METER AMP
Comparator
To FL1
IC601
POWER AMP
NF
Bias
HEADPHONES
R ch
S601
(REMOTE)
REMOTE
SPEAKERS
MAIN
S601
(MAIN)
ON
OFF
D808
D807
D806
D801
a b c
A
B
C
IC801
MICRO-COMPUTER
STOP
ST
CLK
DATA
STB
START
MUTE
PHONO
TUNER
CD/AUX
TAPE 1
TAPE 2
VCR1
VDD
PWR
REMOTE
REC
PLAY
DECK CONT.
VOL 1
VOL 2
VOL 3
VOL 4
VOL 5
VOL 6
VOL 7
OSC OUT
OSC IN
TURN-TABLE
REMOTE CONTROL
CD
DECK
D809 D810
Q802,804,805
Switching /remote
D827
S808 (VCR2)
S807 (CD)
S806 (TUNER)
S805 (PHONO)
S811 (LOUD)
S810 (TAPE)
S809 (VCR1)
S801 (VOL. DOWN)
S802 (VOL. UP)
S803 (BAL. R ch)
S804 (BAL. L ch)
KEY MATRIX CIRCUIT
Z251

D701~704
RECT.
T701
S901
(POWER)
F1
AC IN
To FL1

■ RESISTORS & CAPACITORS

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example

ERD	25	F	J	102
Type	Wattage	Shape	Tolerance	Value

ERX	2	AN	J	471
Type	Wattage	Shape	Tolerance	Value

47x10¹ (ohm)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	330
Type	Voltage	Peculiarity	Value

(33x10⁰ microfarad)

Resistor Type	Wattage	Tolerance
ERD : Carbon ERG : Metal Oxide ERX : Metal Film ERQ : Fuse Type Metal ERD□ L : Carbon (chip) ERQ□ K : Metal Film (chip) ERC : Solid	10 : 1/8W 12 : 1/2W 25 : 1/4W 1A : 1W 18 : 1/8W S2 : 1/4W S1 : 1/2W 2F : 1/4W 50 : 1/2W 2A : 2W	J : ±5% F : ±1% G : ±2% K : ±10%

Capacitor Type	Voltage	Tolerance
ECE : Electrolytic ECCD : Ceramic ECKD : Ceramic ECQM : Polyester ECQP : Polyproylene ECG : Ceramic ECEA□□□N: Non Polar Electrolytic QCU□ : Ceramic (Chip Type) ECUX : Ceramic (Chip Type) ECF : Semiconductor EECW : Liquid electrolyte double layer capacitor	0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1H : 50V 1V : 35V 50 : 50V 05 : 50V 2H : 500V 2A : 100V 1 : 100V KC: 400V AC KC: 125VAC (UL) 1J : 63V	C : ±0.25pF J : ±5% K : ±10% Z : +80% −20% P : +100% −0% M : ±20% D : ±0.5pF G : ±2%

Ref. No.	Part No.
RESISTORS	
R1, R2	ERDS2TJ391
R3, R4	ERDS2TJ224
R5, R6	ER0S2TKG5622
R7, R8	ERDS2TJ271
R9, R10	ERDS2TJ680
R11, R12	ERDS2TJ184
R13, R14	ERDS2TJ123
R15, R16	ERDS2TJ563
R17, R18	ERDS2TJ102
R201	ERDS2TJ332
R202	ERDS2TJ824
R203	ERDS2TJ122
R204	ERDS2TJ824
R205	ERDS2TJ271
R206	ERDS2TJ561
R207	ERDS2TJ822
R208	ERDS2TJ102
R209	ERDS2TJ471
R210	ERDS2TJ332
R212	ERDS2TJ153
R213	ERDS2TJ104
R214	ERDS2TJ824
R215	ERDS2TJ822
R216	ERDS2TJ563
R217	ERDS2TJ223
R218	ERDS2TJ123
R219	ERDS2TJ562
R220	ERDS2TJ103
R221	ERDS2TJ104
R222	ERDS2TJ473
R223	ERDS2TJ154
R225	ERDS2TJ104
R226	ERDS2TJ332
R227	ERDS2TJ104
R228	ERDS2TJ123
R229	ERDS2TJ102
R230	ERDS2TJ104
R231	ERDS2TJ821
R232	ERDS2TJ122
R233	ERDS2TJ684
R234	ERDS2TJ103
R235	ERDS2TJ471
R236	ERDS2TJ223
R237	ERDS2TJ221
R238	ERDS2TJ222
R301	ERDS2TJ103
R302	ERDS2TJ151
R303, R304	ERDS2TJ223
R305, R306	ERDS2TJ272
R307, R308	ERDS2TJ562
R309	ERDS2TJ274
R310	ERDS2TJ103
R311	ERDS2TJ102
R312	ERDS2TJ153
R313, R315	ERDS2TJ103
R316	ERDS2TJ103
R401, R402	ERDS2TJ104
R403, R404	ERDS2TJ273
R407, R408	ERDS2TJ104
R411, R412	ERDS2TJ102
R413, R414	ERDS2TJ470
R501, R502	ERDS2TJ154
R503, R504	ERDS2TJ333
R505, R506	ERDS2TJ102
R507, R508	ERDS2TJ104
R511, R512	ERDS2TJ104
R513, R514	ERDS2TJ472
R515	ERDS2TJ683
R516	ERDS2TJ563
R519, R520	ERDS2TJ472
R598, R599	ERDS2TJ223
R601, R602	ERDS2TJ102
R603, R604	ERDS2TJ393
R605, R606	ERDS2TJ393
R607, R608	ERDS2TJ392
R611, R612	ERDS1FJ100
R613, R614	ERDS2TJ470
R619	ERDS2TJ684
R620	ERD25FJ470
R621, R622	ERDS1FJ151
R623, R624	ERDS1FJ181
R650	ERDS2TJ103
R650	ERDS2TJ183
R651	ERDS2TJ103
R651	ERDS2TJ183
R701	ERDS1FJ2R2
R702	ERD25FJ820
R703	ERDS2TJ681
R704, R705	ERDS2TJ1R2
R706, R707	ERDS2TJ272
R708	ERDS2TJ222
R710	ERDS1FJ2R2
R711	ERDS2TJ101
R712	ERDS2TJ222
R713	ERG2ANJ101
R715, R716 ⚠	ERDS1FJ1R0
R717	ERDS1FJ100
R718, R719	ERDS1FJ152
R751, R752	ERDS2TJ103
R753	ERDS2TJ123
R765	ERDS2TJ392
R771, R772	ERDS1FJ4R7
R773	ERDS1FJ4R7
R774	ERDS2TJ183
R801	ERDS2TJ105
R802	ERDS2TJ104
R804	ERDS2TJ472
R806, R807	ERDS2TJ103
R808	ERDS2TJ103
R809, R810	ERDS2TJ473
R811	ERDS2TJ473
R813, R814	ERDS2TJ103
R815, R816	ERDS2TJ103
R817, R818	ERDS2TJ103
R820	ERDS2TJ104
R821, R822	ERDS2TJ471
R823, R824	ERDS2TJ473
R825, R826	ERDS2TJ472
R843	ERDS2TJ103
R844	ERDS2TJ561
R845, R846	ERDS2TJ472
R847, R848	ERDS2TJ103
R849, R851	ERDS2TJ103
R852	ERDS2TJ104
R853, R854	ERDS2TJ103
R855	ERDS2TJ122
R856	ERDS2TJ103

Ref. No.	Part No.
R857	ERDS2TJ122
R858	ERDS2TJ101
R859, R860	ERDS2TJ271
R861	ERDS2TJ222
R862	ERDS2TJ221
R904, R905	ERDS2TJ103
R906	ERDS2TJ101
R907	ERDS2TJ151
R908	ERDS2TJ102
R909	ERDS2TJ561
R910	ERDS2TJ103
R911	ERDS2TJ562
R913	ERDS2TJ681
R914, R915	ERDS2TJ104
R916, R917	ERDS2TJ104
R919	ERDS2TJ562
R920	ERDS2TJ105
R921	ERDS2TJ224
R922	ERDS2TJ103
R923	ERDS2TJ123
R924	ERDS2TJ563
R927, R928	ERDS2TJ103
R929	ERDS2TJ224
R931	ERDS2TJ181
R936	ERDS2TJ103
R937	ERDS2TJ104
R942	ERDS2TJ103
R946	ERDS2TJ101
R946	ERDS2TJ682
R947	ERDS2TJ101
R947, R948	ERDS2TJ682
R949, R950	ERDS2TJ682
R951	ERDS2TJ682
CAPACITORS	
C1, C2	ECEA1HK3R3
C3, C4	RCBS1H101KBY
C5, C6	ECKD1H102KB
C7, C8	ECQM1H223JZ
C9, C10	ECQM1H682JZ
C11, C12	ECEA1HN010
C13, C14	ECEA0JK330
C101, C201	ECKD1H103PF
C202	ECKD1H103PF
C203, C204	ECCD1H470K
C205	ECKD1H223PF
C206	ECCD1H080CC
C207	ECCD1H470K
C208	ECEA0JU101
C209	ECEA1HK3R3
C210, C211	ECKD1H223PF
C212	ECKD1H223PF
C213	ECCD1H101K
C214	ECEA1CKS100
C215	ECKD1H103PF

Ref. No.	Part No.
C216	ECEA1CKS100
C217	ECEA1HK010
C218	ECEA1CU100
C219	ECEA1CKS100
C220	ECEA1HK2R2B
C221	ECFTD183KXL
C222	ECQM1H473JZ
C223	ECCD1H100KC
C224	ECQP1471JZ
C225	ECCD1H180KC
C226	ECKD1H103PF
C227	ECEA1CKS100
C301	ECEA1CU101
C302	ECEA1HKR47
C303	ECEA1HK010
C304, C305	ECEA1HK3R3
C306	ECEA1HK3R3
C307, C308	ECFTD153KXL
C309	ECKD1H103PF
C310	ECFTD473KXL
C311	ECQP1471JZ
C397, C398	ECFTD332KXL
C401, C402	ECEA1EK3R3
C403, C404	ECCD1H100KC
C405, C406	ECEA1CKS100
C407, C408	ECCC1H221K
C409, C410	ECBT1E103ZF5
C411, C412	ECBT1E103ZF5
C413, C414	ECBT1E103ZF5
C415	ECKD1H103PF
C501, C502	ECFTD223KXL
C503, C504	ECCD1H270K
C505, C506	ECEA1CN100S
C507, C508	ECCD1H010CC
C509, C510	ECEA1EN4R7S
C511	ECEA1HK0R1
C513, C514	RCBS1H101KBY
C551, C552	ECKD1H103PF
C553	ECKD1H103PF
C554, C555	ECEA1CKS100
C556	ECCD1H120KC
C601, C602	ECEA1EK3R3
C603, C604	ECCC1H221K
C605, C606	ECCD1H120KC
C607, C608	ECEA1CK220
C609, C610	ECKD1H102KB
C611, C612	ECKD1H473ZF
C613	ECEA1HS330
C614	ECEA1VU470
C616	ECEA1EK4R7
C701, C702 ⚠	ECETS45V822U
C703	ECEA1HS330
C704	ECKD1H103PF
C705	ECEA1CK101

Ref. No.	Part No.
C706, C708	ECKD1H103PF
C710, C711	ECEA1VU470
C712	ECKD1H103PF
C713	ECQE1104KN
C714	ECEA1CK101
C715	ECEA1HK4R7
C716	ECEA1CK101
C717	ECEA1HS471
C720	ECKD1H103PF
C801	ECEA1HK2R2B
C802	EECF5R5U473
C803, C804	ECEA1HK010
C805, C806	ECEA1CKS100
C823, C824	ECFTD183KXL
C825, C826	ECEA1CKS100
C831, C832	ECFTD222KXL
C833, C834	ECQM1H154JZ
C839, C840	ECKD1H331KB
C841, C842	ECFTD103KXL
C843, C844	ECEA1EK100
C845, C846	ECCD1H820K
C847, C848	ECKD1H471KB
C849, C850	ECEA1EK100
C853, C854	ECEA1EK3R3
C855	ECEA1HK010
C856	ECEA0JU101
C862	ECEA0JU471
C863	ECEA1CKS100
C890	ECBT1E103ZF5
C901	ECKDKC103PF2
C904	ECCD1H181K
C905	ECEA0JK221
C906	ECEA1CU330
C907	ECKD1H103PF
C908	ECEA25M4R7R
C909	ECKD1H223PF
C910	ECEA0JU101
C911	ECKD1H103PF
C912	EECF5R5U473
C914, C915	ECCD1H101K
C916	ECEA1HKR22
C917	ECEA1HK0R1
C918, C919	ECCD1H181K
C920	ECKD1H103PF
C921	ECEA0JU101
C923, C925	ECKD1H331KB
C926	ECKD1H331KB
C929	ECEA1HK3R3
C930, C931	ECQM1H104JZ
C932	ECEA1AU470
C934	ECEA1VK100
C935, C936	ECCD1H150KC
C937	ECEA1VU4R7
R912	ERDS2TJ223

■ REPLACEMENT PARTS LIST

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN6558F	I.C., PHONO EQUALIZER
IC201	AN7273A	I.C., FM IF DET & AM CON.
IC301	AN7470	I.C., FM MPX
IC401	TC9163N	I.C., INPUT SELECTOR
IC402	M5218L	I.C., BUFFER AMP.
IC501	TC9177P	I.C., VOLUME CONTROL
IC502, IC503	M5238P	I.C., BUFFER AMP.
IC601	SVI3102A	I.C., POWER AMP.
IC801	M50720-408SP	I.C., MICROCOMPUTER
IC804	SVIBA6148	I.C., COMPARATOR
IC805, IC806	M5226P	I.C., EQUALIZER
IC901	LM7001	I.C., PLL CONTROL
IC902	LC6512A3312	I.C., MICROCOMPUTER
IC903	LC6513A-3264	I.C., MICROCOMPUTER
TRANSISTORS		
Q201, Q202	2SC2787L	TRANSISTOR
Q203, Q204	2SC1740SQ	TRANSISTOR
Q205	2SC1740SQ	TRANSISTOR
Q206	2SA933SQR	TRANSISTOR
Q207	2SC1740SQ	TRANSISTOR
Q208, Q209	2SA933SQR	TRANSISTOR
Q210, Q212	2SC1740SQ	TRANSISTOR
Q213, Q214	2SC1740SQ	TRANSISTOR
Q501, Q502	2SD381D	TRANSISTOR
Q503	2SA1309AQS	TRANSISTOR
Q701, Q702	2SD1265-0	TRANSISTOR
Q703	2SC3311A-Q	TRANSISTOR
Q704	2SC1384NCQRS	TRANSISTOR
Q705	2SB941-P	TRANSISTOR
Q706	2SA684-RNC	TRANSISTOR
Q751	2SA1309AQS	TRANSISTOR
Q752, Q753	2SC3311A-Q	TRANSISTOR
Q758	2SA684-RNC	TRANSISTOR
Q801	2SC1740SQ	TRANSISTOR
Q802	UN4111	TRANSISTOR
Q804	UN4113	TRANSISTOR
Q805	UN4215	TRANSISTOR
Q806	UN4111	TRANSISTOR
Q812, Q813	UN4213	TRANSISTOR
Q819, Q820	UN4115	TRANSISTOR
Q821, Q822	UN4115	TRANSISTOR
Q823, Q824	UN4115	TRANSISTOR
Q825, Q826	UN4115	TRANSISTOR
Q827, Q828	UN4115	TRANSISTOR
Q829	UN4115	TRANSISTOR
Q830	UN4113	TRANSISTOR
Q831	UN4211	TRANSISTOR
Q865	UN4113	TRANSISTOR
Q901, Q902	2SC2785F	TRANSISTOR
Q904, Q905	2SC1740SQ	TRANSISTOR
Q906, Q907	2SC1740SQ	TRANSISTOR
Q908, Q909	2SC1740SQ	TRANSISTOR
Q910, Q911	2SC1740SQ	TRANSISTOR
Q920	UN4111	TRANSISTOR
Q921	2SC1740SQ	TRANSISTOR
Q922	UN4213	TRANSISTOR
DIODES		
D201	MA165	DIODE
D202	MA4110M	DIODE
D203	KV1260Z	DIODE
D204, D205	MA165	DIODE
D206	MA165	DIODE
D501, D502	MA4030M	DIODE
D701, D702 ⚠	SVDS2V20	RECTIFIER

Ref. No.	Part No.	Description
D703, D704 ⚠	SVDS2V20	RECTIFIER
D705	MA4062-M	DIODE
D706	MA4300M	DIODE
D707	MA4051-M	DIODE
D708	MA4150M	DIODE
D709, D711	MA167	DIODE
D713, D714	MA29WA	DIODE
D715	SVDSR1K2	DIODE
D716 ⚠	SVD1SR35200A	RECTIFIER
D801, D802	MA165	DIODE
D803, D804	MA165	DIODE
D806, D807	MA165	DIODE
D808	MA165	DIODE
D809, D810	MA29WA	DIODE
D811, D812	MA165	DIODE
D818, D819	MA4030M	DIODE
D821, D822	MA165	DIODE
D824, D825	MA165	DIODE
D827	MA165	DIODE
D828, D831	MA4075M	DIODE
D832, D833	MA165	DIODE
D834, D835	MA165	DIODE
D901, D902	MA165	DIODE
D903, D904	MA165	DIODE
D905, D906	MA165	DIODE
D907, D908	MA165	DIODE
D909, D910	MA165	DIODE
D911, D912	MA165	DIODE
D913, D914	MA165	DIODE
D915, D916	MA165	DIODE
D917, D918	MA165	DIODE
D919	MA165	DIODE
D920	SWV66	L.E.D
D921, D922	MA165	DIODE
D923	MA165	DIODE
D926	MA4068M	DIODE
D927, D928	MA165	DIODE
D929	MA165	DIODE
VARIABLE RESISTORS		
VR301	EVND4AA00B53	V.R., 5KΩ(B)
VR801, VR803	EVBJR5J15G15	VARIABLE RESISTOR
VR805	EVBJR5J15G15	VARIABLE RESISTOR
VARIABLE CAPACITORS		
CT201	ECRHA010A41	TRIMMER
COILS AND TRANSFORMERS		
L201	SLA2B1-P	ANTENNA COIL
L202	SL02B7-W	COIL
L203, L204	ELEXT1R2MA	COIL
L301, L302	SLM1B9-P	MPX COIL
L601, L602	SLQY07G-4A	CHOKE COIL
L801, L803	ELEXT101KA	COIL
L850	ELEPK1R2MA	COIL
L851	ELEPK101KA	CHOKE COIL
L901	ELEXTR47MA	COIL
L902	ELEXT1R2MA	COIL
L903	ELEXT101KA	COIL
T1 ⚠ (EX, EH)	SLT5M507-W	POWER TRANSFORMER
T1 ⚠ (XL)	SLT5M508-W	POWER TRANSFORMER
T201	SLI2B101-M	I.F.TRANSFORMER
T202	SLI4B511-Z	I.F.TRANSFORMER
T203	SLI4B513-Z	I.F.TRANSFORMER
COMPONENT COMBINATIONS		
Z301, Z302	EXRP102K473T	0.01μF + 47KΩ

Ref. No.	Part No.	Description
Z802	GP1U509M	DIODE, REMOTE SENSOR
Z803	EXBF10E104J	100KΩ X 10
Z901	EXFP8331MW	330Ω X 8
Z902	EXBF9E104J	100KΩ X 9
Z903, Z904	EXBF8E103J	10KΩ X 8
Z905	EXBF8E103J	10KΩ X 8
Z906	EXFP8331MW	330Ω X 8
Z907	EXBF12E104J	100KΩ X 12
Z908	EXBF8E104J	100kΩ× 8
FILTERS		
CF201, CF202	SVFE107MS8-Q	CERAMIC FILTER
CF203	SVFSFZ450F7L	CERAMIC FILTER
CF801	EF0FC2004A4	CERAMIC FILTER
CF901	SVFCSB960D	CERAMIC FILTER
CF902	SVFCSB800K-M	CERAMIC FILTER
OSCILLATORS		
X901	SVQ49U722-S	CRYSTAL OSCILLATOR
DISPLAYS		
FL1	SADBG422GK	DISPLAY TUBE
FRONT PACKS		

Ref. No.	Part No.	Description
CABINET AND CHASSIS		
1	SKUAR210-KM	BOTTOM BOARD
1-1	SKL293	RUBBER
2 (EH)	SGPAR210-KEH	REAR PANEL
2 (EX, EH)	SGP7050-1A	REAR PANEL
2 (XL)	SGP7050-1C	REAR PANEL
3 ⚠ (EX, EH)	SJS9231B	AC INLET
3 ⚠ (XL)	SJS9234B	AC INLET
5	SMX463	INSULATION COVER
6	SYYAR210KM	FRONT PANEL
8	SBZK29	L.E.D. BLOCK
9	SBDK9	KNOB, G.E.Q
10	SBC315-7	BUTTON, SPEAKER
11	SBC666-5	BUTTON, POWER
12	SBC932A	BUTTON, CONTROL
13	SBC933A	BUTTON, VOLUME
14	SBZ691A	BUTTON, SELECTOR
15	SBZ691-1A	KNOB, NUMERIC
16	SMC6444	SHIELD COVER
17	SUW3073	BRACKET
18	SHR415	LOCK PIN
19	SHR9828	P.C.B. HOLDER
20	SHR9829	PLASTIC SPACER
21	SHE185-1	SPACER
22	SJP9205-2Y	SHORTING PIN
23	SMC6431	SHIELD COVER
24	SMC6434	SHIELD COVER
25	SBC165	BUTTON, IMPEDANCE
32	SKC1880K991	CABINET
33	SMC6443	SHIELD COVER
34	SMC6379	SHIELD COVER
35	SME103-4	SHIELD PLATE
36 (EX, EH)	SJS9231A	AC. INLET COVER
36 (XL)	SJS9234A	AC INLET COVER
38	SJF4818-1	TERMINAL BOARD

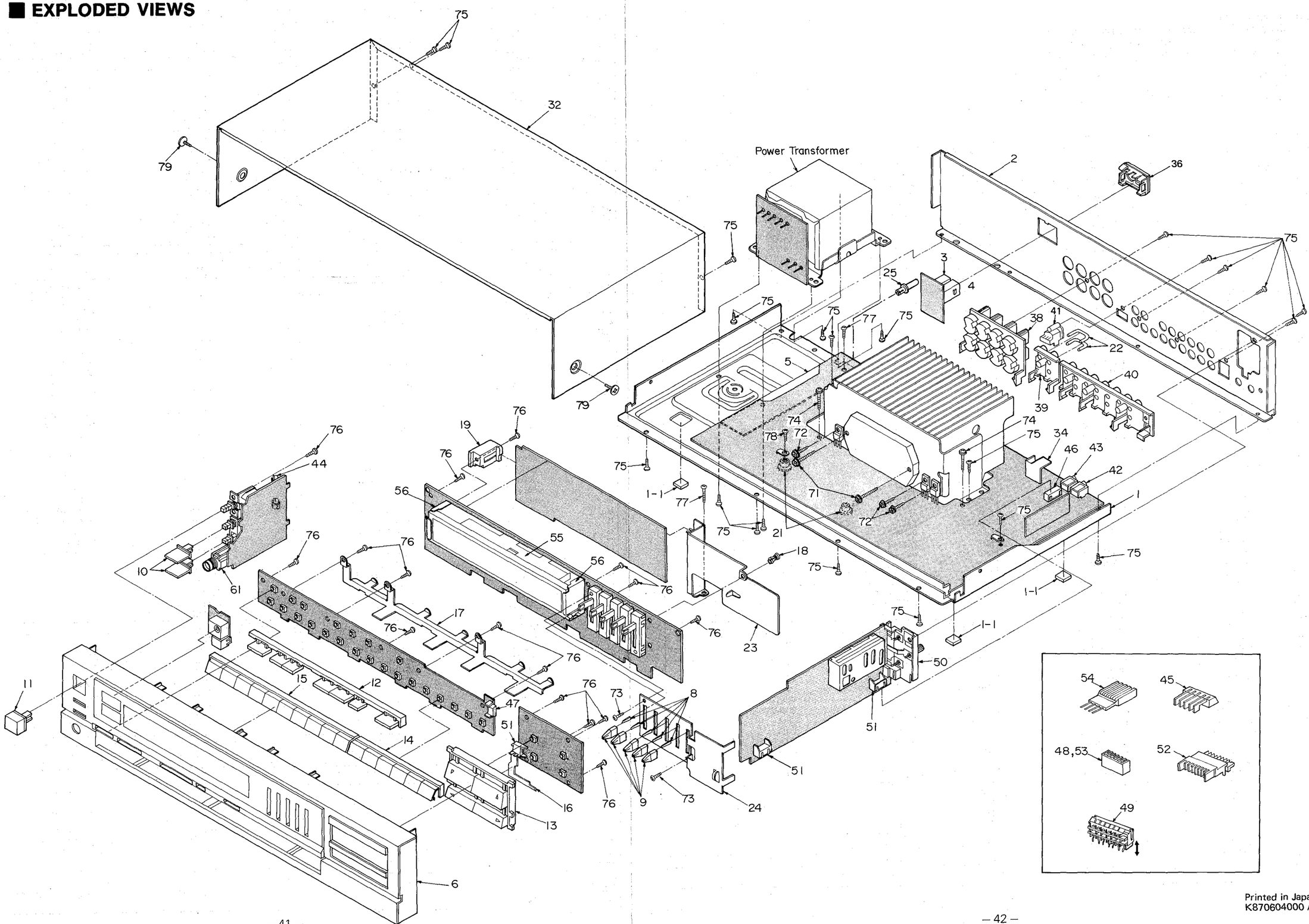
Ref. No.	Part No.	Description
PACKINGS		
P1	SPG5971	CARTON BOX
P2	SPS4839-1	PAD
P3	SPS4840-1	PAD
P4	SPS4693	PAD
P5	SPS4726-2	PAD
P6	SPS5000	PAD
P7	SPP719	PROTECTION COVER
ACCESSORIES		
A1 ⚠ (EX, EH)	SFDAC05E03	POWER CORD
A1 ⚠	SJA173	POWER CORD

Ref. No.	Part No.	Description
SNV1	SNVFE202E02	TUNER, FRONT END
FUSES		
F1 ⚠	XBA2C10NS5	FUSE, 250V, 1A
SWITCHES		
S601	SSH2130	SW, SPEAKER
S701	SSH1193	SW, IMPEDANCE
S801, S802	SSG13	SW, VOLUME
S803, S804	EVQQAC05G	SW, BALANCE
S805, S806	EVQQAC05G	SW, SELECTOR
S807, S808	EVQQAC05G	SW, SELECTOR
S809, S810	EVQQAC05G	SW, SELECTOR
S811, S812	EVQQAC05G	SW, SELECTOR
S813, S814	EVQQAC05G	SW, SELECTOR
S815, S816	EVQQAC05G	SW, SELECTOR
S817, S818	EVQQAC05G	SW, SELECTOR
S819, S820	EVQQAC05G	SW, SELECTOR
S821, S822	EVQQAC05G	SW, SELECTOR
S823, S824	EVQQAC05G	SW, SELECTOR
S825, S826	EVQQAC05G	SW, SELECTOR
S901 ⚠	ESB8249V	POWER SWITCH

Ref. No.	Part No.	Description
39	SJF3062-3N	TERMINAL BOARD
40	SJF3057NK	TERMINAL BOARD
41	SJS306	CONNECTOR
42	SJJ130-3	JACK
43	SJJ130-2	JACK
44	SJT390	FUSE HOLDER
45	SJS50680WL	CONNECTOR
45	SJS50780WL	CONNECTOR
46	SJS50678JQ	CONNECTOR
46	SJS50778JQ	CONNECTOR
47	SJS50582JQH	CONNECTOR
48	SJS50681BB	CONNECTOR
49	SJT30540LX-V	CONNECTOR(5-P)
49	SJT31040LX-V	LUG TERMINAL
50 (XL)	SJF4441-1P	TERMINAL BOARD
50 (EX, EH)	SJF4441-4P	TERMINAL PLATE
51	SJT30545JQ	CONNECTOR
51	SJT30645JQ	TERMINAL PLATE
51	SJT30745JQ	TERMINAL PLATE
52	SJT30647WL	CONNECTOR
52	SJT30747WL	TERMINAL PLATE
53	SJT30549BB	TERMINAL PLATE
53	SJT30648BB	TERMINAL PLATE
53	SJT30948BB	TERMINAL PLATE
54	SJS50581BB	CONNECTOR
54	SJS50681BB	CONNECTOR
54	SJS50981BB	CONNECTOR
55	SUW3058	BRACKET
56	SUW3074	BRACKET
61	QJA0455ZC	JACK
SCREWS.WASHERS & NUTS		
71	SNE2118	SCREW
72	SNE2117-1	SCREW
73	XSN2+3	SCREW
74	XTW3+8T	SCREW
75	XTBS3+8JFZ1	SCREW
76	XTB3+8G	SCREW
77	XTB3+16J	SCREW
78	XTBS3+16F1	SCREW
79	SNE2129-3	ORNAMENT SCREW

Ref. No.	Part No.	Description
(XL) A2	SSA269M	FM ANTENNA
(XL) A2	SSA270M	FM ANTENNA
(EX, EH) A3	SPB1152T	AM ANTENNA
A4	UM-3NE-2P	BATTERY
A5	SQF12959	INSTRUCTION BOOK
(EX, EH) A5	SQF12960	INSTRUCTION BOOK
(XL) A6	SWKST11M-1	CORD, REMOTE CONTROL

■ EXPLODED VIEWS



Printed in Japan
K870604000 AM

ORDER NO. HAD8708274S0
A2

Service Manual

Receiver

Supplement

QUARTZ Synthesizer
AM/FM Stereo Receiver

SA-R210

Color

(K).....Black Type

Area

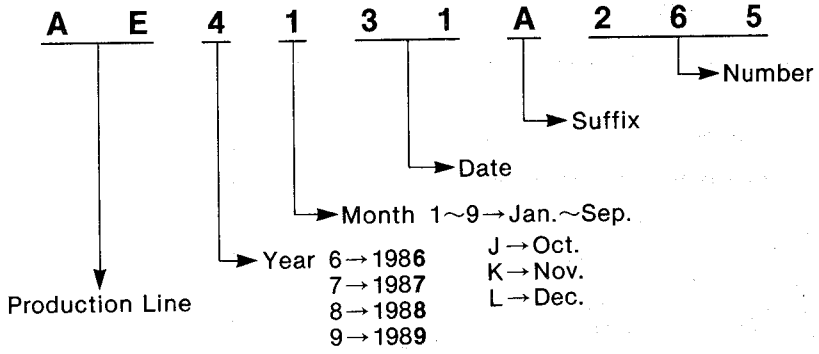
Color	Area
(K)	(M) . . . . . U.S.A.
(K)	(MC) . . . . Canada.
(K)	(EX) . . . . Continental Europe.
(K)	(EH) . . . . Holland.
(K)	(XL) . . . . Australia.

Please file and use this supplement manual together with the service manual for Model No. SA-R210, Order No. HAD8704104C1 ([M],[MC] areas), Order No. HAD8706173C8 (Other areas).

Note:

- This supplement has been issued to inform you that the remote-control circuit has been changed in units having serial number suffixes "C" or later. (Refer to "How to read the serial number" shown below.)

● How to read the serial number



CHANGES

■ REPLACEMENT PARTS LIST

Ref. No.	Change of Part No. OLD → NEW		Description	Schematic Diagram Zone
DIODE				
D809	MA29WA	– – – – –	Deletion, Switching Diode	A–13

Technics

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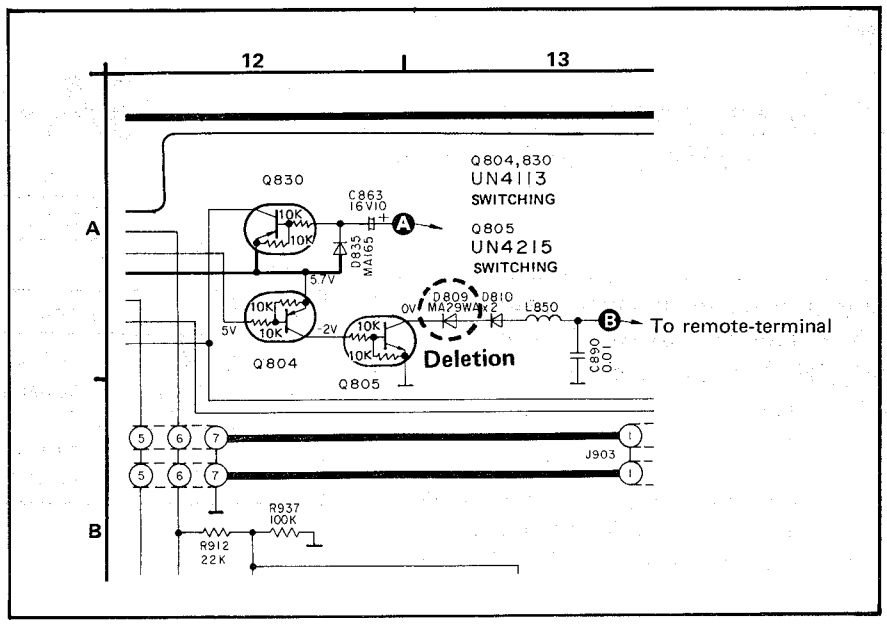
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

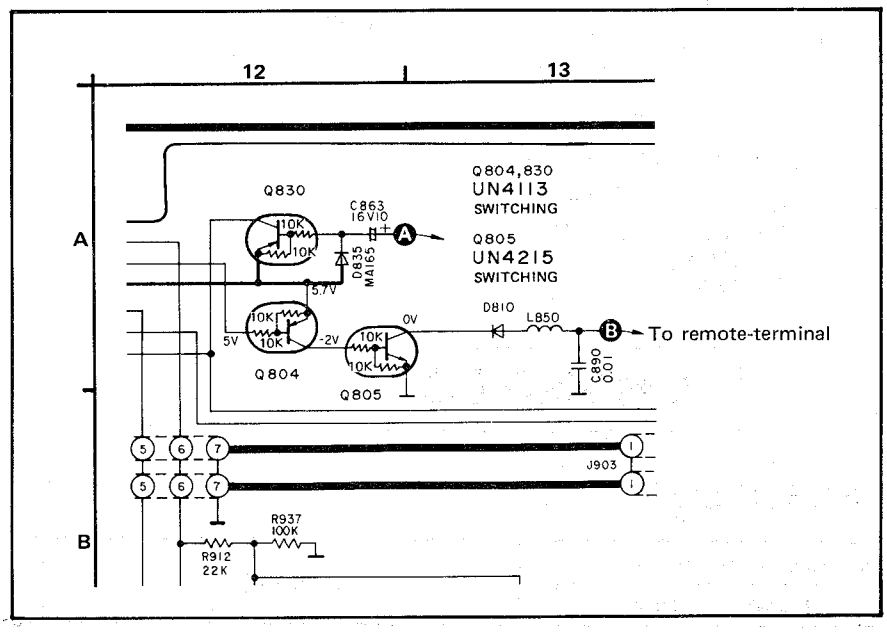
■ SCHEMATIC DIAGRAM

Note: D809 has been deleted to improve the efficiency of the remote-control.

(OLD)



(NEW)



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K870904750A

ORDER NO. AD8911333S5
A2

Service Manual

Receiver

Supplement

QUARTZ Synthesizer
AM/FM Stereo Receiver

SA-R230

Color

(K)...Black Type

Area

Country Code	Area	Color
(M)	U.S.A.	(K)
(MC)	Canada.	
(EX)	Continental Europe.	
(EH)	Holland.	
(XL)	Australia.	
(EG)	F.R. Germany.	

Please file and use this supplement manual together with the service manual for Model No. SA-R230, Order No. AD8804016C1 (M, MC areas), AD8806125C2 (EX, EH, XL areas) or AD8807199C2 (EG area).

Note:

- This supplement has been issued to correct an error in the "Replacement Parts List".
  Please correct your service manual as follows.

CORRECTION

■ REPLACEMENT PARTS LIST

- The "Part Name & Description" is the correction. (Page 18 of service manual.)

Ref. No.	Part No.	Change of Part Name & Description ORIGINAL → NEW		Remarks
VARIABLE RESISTORS				
VR501	EUWMV7F20B15	V. R, BALANCE	**V. R, MAIN**	
VR502	EWHFDAF20G15	V. R, MAIN	**V. R, BALANCE**	

- The "Part No." is the correction. (Page 41 of service manual.)
  (M, MC areas only)

Ref. No.	Change of Part No. ORIGINAL → NEW		Part Name & Description	Remarks
ACCESSORY				
A5	SPB1162T	**SPB1152T**	AM LOOP ANTENNA	

Technics

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Central P.O. Box 288,
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Printed in Japan
K891107000TN

ORDER NO. HAD8708276S2

Service Manual

Supplement

Receiver

SA-180
SA-180L

QUARTZ Synthesizer AM/FM Stereo Tuner Receiver (SA-180)

QUARTZ Synthesizer LW/MW/FM Stereo Tuner Receiver (SA-180L)

Please file and use this supplement manual together with the service manual for Model No. SA-180/180L, Order No. HAD8706179C2.

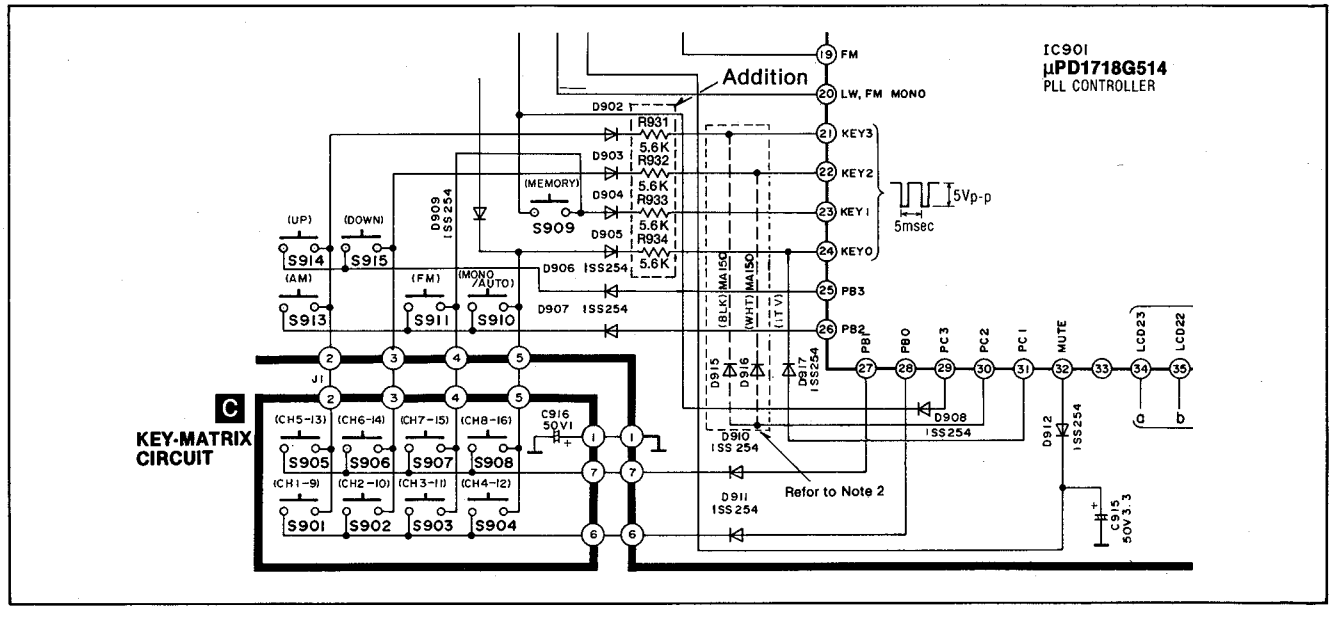
Note:

- The key-matrix circuit of this unit has been changed for the improvement of performance.

CHANGES

■ SCHEMATIC DIAGRAM

Note: These resistors have been added to protect IC901 from damage due to static electricity.



■ REPLACEMENT PARTS LIST

Ref. No.	Change of Part No. OLD	Change of Part No. NEW	Part Name & Description	Remarks
RESISTORS				
R931~934	——	**ERDS2TJ562**	Carbon, 1/4W, 5.6kΩ, ±5%	Addition

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

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